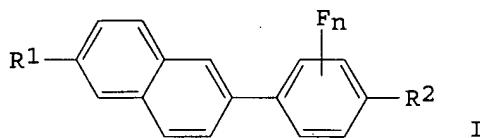


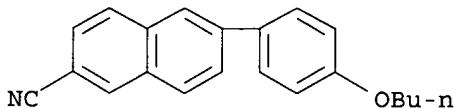
AN 1991:33611 CAPLUS
 DN 114:33611
 TI Phenylnaphthalenes and liquid-crystal mixtures
 containing them
 IN Gray, George William; Toyne, Kenneth Johnson; Lacey, David; Hird, Michael
 PA United Kingdom Secretary of State for Defence, London, UK
 SO PCT Int. Appl., 22 pp.
 CODEN: PIXXD2
 DT Patent
 LA English
 IC ICM C07C025-24
 ICS C09K019-32; C07C043-225; C07C255-54; C07C255-52
 CC 75-11 (Crystallography and Liquid Crystals)
 Section cross-reference(s): 25, 74
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9008119	A1	19900726	WO 1990-GB69	19900116
	W: GB, JP, KR, US				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, IT, LU, NL, SE				
	GB 2227019	A1	19900718	GB 1990-965	19900116
	GB 2227019	B2	19920930		
	EP 453503	A1	19911030	EP 1990-902655	19900116
	EP 453503	B1	19950322		
	R: AT, BE, CH, DE, DK, ES, FR, GB, IT, LI, LU, NL, SE				
	JP 04504571	T2	19920813	JP 1990-502987	19900116
	GB 2238309	A1	19910529	GB 1990-24433	19901109
	GB 2244710	A1	19911211	GB 1991-13419	19910621
	GB 2244710	B2	19920930		
	✓ US 5252253	A	19931012	US 1991-721440	19910716
PRAI	GB 1989-870		19890116		
	GB 1989-25414		19891110		
	WO 1990-GB69		19900116		
OS	CASREACT 114:33611; MARPAT 114:33611				
GI					

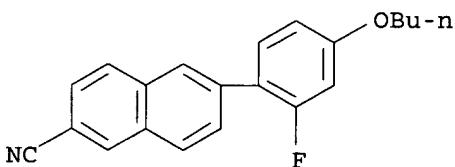


AB The compds. have the formula I, where R1,R2 = C1-15 alkyl, alkoxy, perfluoroalkyl, perfluoroalkoxy, or alkynyl (R1 may also be CN and R2 may also be F or NCS); and m = 0-2.
 ST phenylnaphthalene liq crystal; fluorophenylnaphthalene liq crystal
 IT Liquid crystals
 (phenylnaphthalenes)
 IT Optical imaging devices
 (electro-, liq.-crystal, phenylnaphthalenes for)
 IT Liquid crystals
 (ferroelec., phenylnaphthalenes)
 IT Ferroelectric substances
 (liq.-crystal, phenylnaphthalenes)
 IT 131340-06-2
 RL: PRP (Properties)
 (liq. crystal)
 IT 131339-97-4P 131339-98-5P 131339-99-6P 131340-00-6P 131340-01-7P
 131340-02-8P 131340-03-9P 131340-04-0P
 131362-00-0P

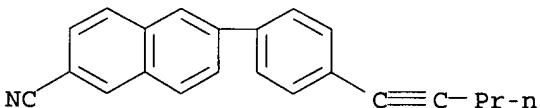
RL: SPN (Synthetic preparation); PREP (Preparation)
(prepn. of, for liq.-crystal mixts.)
IT 131340-02-8P 131340-03-9P 131362-00-0P
RL: SPN (Synthetic preparation); PREP (Preparation)
(prepn. of, for liq.-crystal mixts.)
RN 131340-02-8 CAPPLUS
CN 2-Naphthalenecarbonitrile, 6-(4-butoxyphenyl)- (9CI) (CA INDEX NAME)



RN 131340-03-9 CAPPLUS
CN 2-Naphthalenecarbonitrile, 6-(4-butoxy-2-fluorophenyl)- (9CI) (CA INDEX NAME)



RN 131362-00-0 CAPPLUS
CN 2-Naphthalenecarbonitrile, 6-[4-(1-pentynyl)phenyl]- (9CI) (CA INDEX NAME)



AN 1993:59433 CAPLUS
 DN 118:59433
 .TI Preparation of (hetero)arylnaphthalenes as liquid
 crystals
 IN Toyne, Kenneth Johnson; Goodby, John William; Seed, Alexander; Gray,
 George William; McDonnell, Damien Gerard; Raynes, Edward Peter; Day, Sally
 Elizabeth; Harrison, Kenneth John; Hird, Michael
 PA United Kingdom Secretary of State for Defence, London, UK
 SO PCT Int. Appl., 37 pp.
 CODEN: PIXXD2
 DT Patent
 LA English
 IC ICM C07C255-54
 ICS C09K019-32; C09K019-34; C07C321-24; C07C331-28; C07D239-26;
 C07D333-24; C07D333-36; G02F001-13
 CC 25-24 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
 Section cross-reference(s): 75
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9216500	A1	19921001	WO 1992-GB411	19920309
	W: CA, GB, JP, KR, US				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, MC, NL, SE				
	CA 2082798	AA	19920914	CA 1992-2082798	19920309
	EP 531475	A1	19930317	EP 1992-906378	19920309
	EP 531475	B1	20020828		
	R: AT, BE, CH, DE, DK, FR, GB, IT, LI, LU, MC, NL, SE				
	JP 05507724	T2	19931104	JP 1992-505576	19920309
	JP 2002145844	A2	20020522	JP 2001-251102	19920309
	US 5496500	A	19960305	US 1994-283714	19940801
	US 5820781	A	19981013	US 1995-470153	19950606
	US 6291034	B1	20010918	US 1998-150737	19980910
	US 2002011588	A1	20020131	US 2001-919908	20010802
PRAI	GB 1991-5359	A	19910313		
	JP 1992-505576	A3	19920309		
	WO 1992-GB411	W	19920309		
	US 1993-2396	B1	19930113		
	US 1994-283714	A3	19940801		
	US 1995-470153	A3	19950606		
	US 1995-243714	B3	19950710		
	US 1998-150737	A3	19980910		
OS	MARPAT 118:59433				
AB	R1A(X) _m (B) _n R2 [I; A = naphthylene, brominated naphthylene, fluorinated naphthylene; B = (substituted) phenylene, thiophenylene, pyrimidinylene, pyridinylene; R1, R2 = alkyl, alkoxy, alkynyl, thioalkyl, Br, cyano, thiocyanato, isothiocyanato, perfluoroalkyl, perfluoroalkoxy, H; X = C.tpbond.C, CO ₂ , C:C; m = 0, 1; n = 0,1 when m = 1; n = 0 when m = 0; with provisos] were prep'd. as liq. crystals. Thus, 2-bromo-6-butylthionaphthalene (prepn. given) was treated with tri-Me borate and BuLi in hexane to give the boronic acid. This was coupled with 4-bromobenzonitrile in the presence of (Ph ₃ P) ₄ Pd to give 2-(4-cyanophenyl)-6-butylthionaphthalene in 81% yield. The latter had cryst. to nematic liq. crystal phase transition temp. of 92.degree..				
ST	heteroarylnaphthalene prep'n liq crystal; arylnaphthalene prep'n liq crystal				
IT	Liquid crystals (hetero)arylnaphthalenes 1003-09-4P, 2-Bromo thiophene 13195-50-1P, 2-Bromo-5-nitrothiophene 32779-36-5P, 5-Bromo-2-chloropyrimidine 38353-06-9P, 5-Bromo-2-hydroxypyrimidine 66217-19-4P 66217-26-3P 145349-58-2P 145349-59-3P 145369-23-9P 145369-24-0P 145369-25-1P 145369-26-2P 145369-27-3P				
	RL: SPN (Synthetic preparation); PREP (Preparation)				

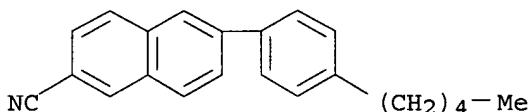
(prep. of, as intermediate for liq. crystal)

IT 145369-12-6P 145369-13-7P 145369-14-8P 145369-15-9P 145369-16-0P
 145369-17-1P 145369-18-2P 145369-19-3P **145369-20-6P**
 145369-21-7P **145369-22-8P**
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (prep. of, as liq. crystal)

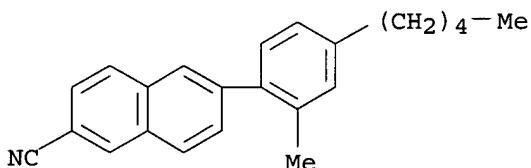
IT 74-83-9, Bromomethane, reactions 109-79-5, Butanethiol 110-02-1,
 Thiophene 121-43-7, Trimethyl borate 463-71-8, Thiophosgene
 544-92-3, Copper cyanide (Cu(CN)) 623-00-7, 4-Bromobenzonitrile
 627-19-0, 1-Pentyne 1493-13-6, Trifluoromethanesulfonic acid
 15231-91-1, 6-Bromo-2-naphthol 38353-09-2, 2-Hydroxypyrimidine
 hydrochloride 145369-28-4 145369-29-5
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (reaction of, in prepn. of liq. crystals)

IT **145369-20-6P 145369-22-8P**
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (prep. of, as liq. crystal)

RN 145369-20-6 CAPPLUS
 CN 2-Naphthalenecarbonitrile, 6-(4-pentylphenyl)- (9CI) (CA INDEX NAME)



RN 145369-22-8 CAPPLUS
 CN 2-Naphthalenecarbonitrile, 6-(2-methyl-4-pentylphenyl)- (9CI) (CA INDEX NAME)



AN 1994:20011 CAPLUS
DN 120:20011
TI The synthesis and high optical birefringence of nematogens incorporating 2,6-disubstituted naphthalenes and terminal cyano-substituents
AU Hird, M.; Toyne, K. J.; Gray, G. W.; Day, S. E.; McDonnell, D. G.
CS Sch. Chem., Univ. Hull, Hull, HU6 7RX, UK
SO Liquid Crystals (1993), 15(2), 123-50
CODEN: LICRE6; ISSN: 0267-8292
DT Journal
LA English
CC 75-11 (Crystallography and Liquid Crystals)
Section cross-reference(s): 25, 73
AB A range of nematogenic materials which incorporate a 2,6-disubstituted naphthyl moiety and a terminal cyano-substituent were synthesized by using Pd-catalyzed cross-coupling procedures involving arylboronic acids and alkynylzinc reagents with aryl iodides, bromides and trifluoromethanesulfonates (triflates). The compds. have very high nematic phase stability, but their m.ps. are also quite high. The birefringences were measured using an extrapolation technique and the values are at 0.26-0.42.
ST naphthalene liq crystal synthesis
IT Birefringence
 (synthesis of nematics of high birefringence with disubstituted naphthalenes and terminal cyano substituents)
IT Coupling reaction catalysts
 (cross-, palladium, for naphthalene liq. crystal prepn.)
IT Liquid crystals
 (nematic, synthesis of nematics of high birefringence with disubstituted naphthalenes and terminal cyano substituents)
IT 67886-69-5 85017-60-3 96693-04-8 151599-91-6
RL: PRP (Properties)
 (acetylation, synthesis of nematics of high birefringence with disubstituted naphthalenes and terminal cyano substituents)
IT 589-87-7 145369-29-5 151599-98-3 151600-02-1
RL: PRP (Properties)
 (acetylenic coupling, synthesis of nematics of high birefringence with disubstituted naphthalenes and terminal cyano substituents)
IT 106-41-2 540-38-5 15231-91-1
RL: PRP (Properties)
 (alkylation, synthesis of nematics of high birefringence with disubstituted naphthalenes and terminal cyano substituents)
IT 5111-65-9 39969-57-8 66217-20-7 109027-84-1
RL: PRP (Properties)
 (boration, synthesis of nematics of high birefringence with disubstituted naphthalenes and terminal cyano substituents)
IT 7440-05-3, Palladium, uses
RL: CAT (Catalyst use); USES (Uses)
 (catalysts, for substituted naphthalene liq. crystal prepn.)
IT 623-00-7 79887-10-8 79887-15-3 87633-68-9 105365-51-3
121219-12-3 126747-14-6 129113-00-4 145369-28-4 151599-95-0
151599-99-4 151600-03-2 151799-95-0
RL: PRP (Properties)
 (coupling, synthesis of nematics of high birefringence with disubstituted naphthalenes and terminal cyano substituents)
IT 66217-19-4
RL: PRP (Properties)
 (cyanation, synthesis of nematics of high birefringence with disubstituted naphthalenes and terminal cyano substituents)
IT 67886-70-8
RL: PRP (Properties)
 (hydrolysis, synthesis of nematics of high birefringence with disubstituted naphthalenes and terminal cyano substituents)

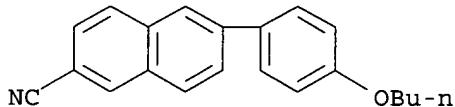
IT 33228-44-3
 RL: PRP (Properties)
 (iodination, synthesis of nematics of high birefringence with
 disubstituted naphthalenes and terminal cyano substituents)

IT 52927-22-7 97825-81-5
 RL: PRP (Properties)
 (sulfonation, synthesis of nematics of high birefringence with
 disubstituted naphthalenes and terminal cyano substituents)

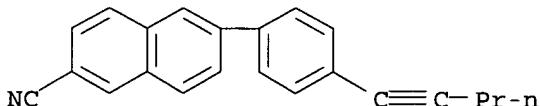
IT 66217-26-3P 66217-27-4P 80493-93-2P 81592-44-1P 87633-73-6P
131340-02-8P 131362-00-0P 145369-20-6P
 151799-90-5P 151799-91-6P 151799-92-7P 151799-93-8P 151799-94-9P
 151799-96-1P 151799-97-2P
 RL: PREP (Preparation)
 (synthesis of nematics of high birefringence with disubstituted
 naphthalenes and terminal cyano substituents)

IT **131340-02-8P 131362-00-0P 145369-20-6P**
 RL: PREP (Preparation)
 (synthesis of nematics of high birefringence with disubstituted
 naphthalenes and terminal cyano substituents)

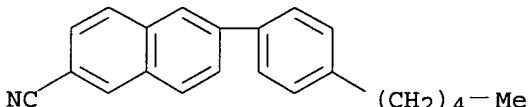
RN 131340-02-8 CAPLUS
 CN 2-Naphthalenecarbonitrile, 6-(4-butoxyphenyl)- (9CI) (CA INDEX NAME)



RN 131362-00-0 CAPLUS
 CN 2-Naphthalenecarbonitrile, 6-[4-(1-pentynyl)phenyl]- (9CI) (CA INDEX NAME)



RN 145369-20-6 CAPLUS
 CN 2-Naphthalenecarbonitrile, 6-(4-pentylphenyl)- (9CI) (CA INDEX NAME)



AN 1999:690815 CAPLUS
DN 131:315912
TI Naphthalene derivative for liquid crystal composition
IN Takehara, Sadao; Osawa, Masashi; Takatsu, Haruyoshi; Negishi, Makoto
PA Dainippon Ink and Chemicals, Inc., Japan
SO Eur. Pat. Appl., 133 pp.
CODEN: EPXXDW

DT Patent
LA English
IC ICM C07C025-22
ICS C09K019-32; C07C025-24; C07C043-225; C07C043-257; C07C013-48;
C07C255-50

CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other
Reprographic Processes)
Section cross-reference(s): 25

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 952135	A1	19991027	EP 1999-107369	19990422
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 11302207	A2	19991102	JP 1998-112147	19980422
	JP 2000026342	A2	20000125	JP 1998-187349	19980702
	JP 2000026341	A2	20000125	JP 1998-191471	19980707
	JP 2000034240	A2	20000202	JP 1998-200352	19980715
	JP 2000063305	A2	20000229	JP 1998-229680	19980814
	JP 2000169413	A2	20000620	JP 1998-348428	19981208
	CN 1246469	A	20000308	CN 1999-109523	19990422
	SG 85639	A1	20020115	SG 1999-1903	19990422
	US 6468607	B1	20021022	US 1999-296550	19990422
	EP 1273562	A1	20030108	EP 2002-22912	19990422
	R: BE, CH, DE, FR, GB, IT, LI, NL				
PRAI	JP 1998-112147	A	19980422		
	JP 1998-187349	A	19980702		
	JP 1998-191471	A	19980707		
	JP 1998-200352	A	19980715		
	JP 1998-229680	A	19980814		
	JP 1998-348428	A	19981208		
	EP 1999-107369	A3	19990422		

OS MARPAT 131:315912

AB Disclosed is a liq. crystal compn. contg. a novel naphthalene deriv. and suited for use in an electrooptical display device. The naphthalene deriv. provided by the present invention exhibits an excellent liq.-crystallinity and miscibility with currently widely used liq. crystal compns. The addn. of the naphthalene deriv. makes it possible to drastically lower the threshold voltage of the liq. crystal compn. while maintaining its high response. The naphthalene deriv. of the present invention is characterized by a large birefringence index. Further, most of the naphthalene deriv. of the present invention has no strongly polar group in its mol. and thus can also be used for active-matrix driving. Moreover, as shown in the foregoing examples, the naphthalene deriv. of the present invention can be easily produced and is colorless and chem. stable.

ST naphthalene deriv liq crystal compn electrooptical display

IT Liquid crystal displays
(liq. crystal compns. contg. naphthalene derivs.
for)

IT 247924-92-1 247924-94-3 247924-96-5 247924-97-6
247924-98-7 247925-00-4

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(liq. crystal compn. for electrooptical display

devices)

IT 247924-49-8P **247924-66-9P** 247924-70-5P
 RL: DEV (Device component use); SPN (Synthetic preparation); TEM
 (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (prepn. and reaction in synthesis of liq. crystals
 for electrooptical display devices)

IT 324-41-4P 2776-56-9P 79861-37-3P 94134-18-6P 247924-27-2P
 247924-28-3P 247924-29-4P 247924-31-8P 247924-33-0P 247924-35-2P
 247924-36-3P 247924-37-4P 247924-39-6P 247924-40-9P 247924-42-1P
 247924-43-2P 247924-46-5P 247924-50-1P 247924-52-3P 247924-53-4P
 247924-55-6P 247924-57-8P 247924-61-4P 247924-69-2P 247924-71-6P
 247924-76-1P 247924-77-2P 247924-79-4P 247924-82-9P
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (prepn. and reaction in synthesis of liq. crystals
 for electrooptical display devices)

IT 121-43-7, Trimethyl borate 358-23-6, Trifluoromethanesulfonic anhydride
 588-93-2, 1-Bromo-4-propylbenzene 2357-52-0, 1-Bromo-3-fluoro-4-
 methoxybenzene 4746-97-8, 1,4-Dioxaspiro[4.5]decan-8-one 5111-65-9,
 6-Bromo-2-methoxynaphthalene 7499-66-3, 6-Bromo-2-naphthylamine
 15231-91-1, 6-Bromo-2-naphthol 32664-14-5 40649-36-3,
 4-Propylcyclohexanone 56309-94-5 62452-73-7 80361-78-0 111158-11-3
 135807-97-5 159524-85-3 247924-32-9 247924-47-6 247924-62-5
247924-65-8 247924-74-9 247924-80-7 247924-83-0
 247924-85-2 247924-87-4
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (reaction in synthesis of liq. crystals for
 electrooptical display devices)

IT 247924-26-1P 247924-30-7P 247924-34-1P 247924-38-5P 247924-41-0P
 247924-44-3P 247924-45-4P 247924-48-7P 247924-51-2P 247924-54-5P
 247924-56-7P 247924-58-9P **247924-59-0P** 247924-60-3P
 247924-63-6P **247924-64-7P** **247924-67-0P** 247924-68-1P
 247924-72-7P 247924-75-0P 247924-78-3P 247924-81-8P 247924-84-1P
 247924-86-3P 247924-88-5P 247924-89-6P 247924-90-9P
 RL: DEV (Device component use); SPN (Synthetic preparation); TEM
 (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (synthesis and use in prepg. liq. crystal compns.
 for electrooptical display devices)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Isoyama, T; JP 61246158 A 1987 CAPLUS
 (2) Lauk, U; Helvetica Chimica Acta 1985, V68(5), P1406 CAPLUS
 (3) Merck Patent GmbH; DE 4116158 A 1992 CAPLUS
 (4) Merck Patent GmbH; GB 2271771 A 1994 CAPLUS
 (5) Nohira, H; JP 09221441 A 1997, 20, CAPLUS
 (6) Secr Defence Brit; WO 9008119 A 1990 CAPLUS
 (7) Sugimori, S; JP 61000031 A 1986 CAPLUS
 (8) Sugimori, S; JP 61091141 A 1987 CAPLUS
 (9) Tamai, K; JP 06157371 A 1995 CAPLUS

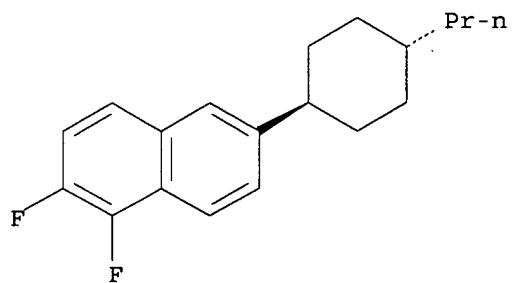
IT **247924-92-1** **247924-94-3**
 RL: DEV (Device component use); TEM (Technical or engineered material
 use); USES (Uses)
 (liq. crystal compn. for electrooptical display
 devices)

RN 247924-92-1 CAPLUS
 CN Naphthalene, 1,2-difluoro-6-(trans-4-propylcyclohexyl)-, mixt. with
 4-[(trans,trans)-4'-(3-butenyl)[1,1'-bicyclohexyl]-4-yl]-1,2-
 difluorobenzene and 4-[(trans,trans)-4'-ethenyl[1,1'-bicyclohexyl]-4-yl]-
 1,2-difluorobenzene (9CI) (CA INDEX NAME)

CM 1

CRN 247924-91-0
 CMF C19 H22 F2

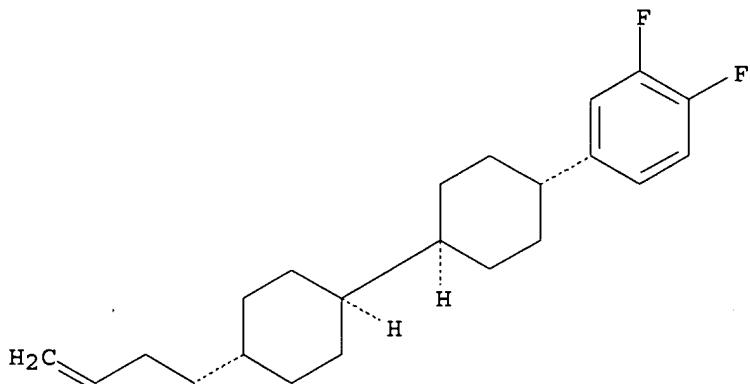
Relative stereochemistry.



CM 2

CRN 155266-68-5
CMF C22 H30 F2

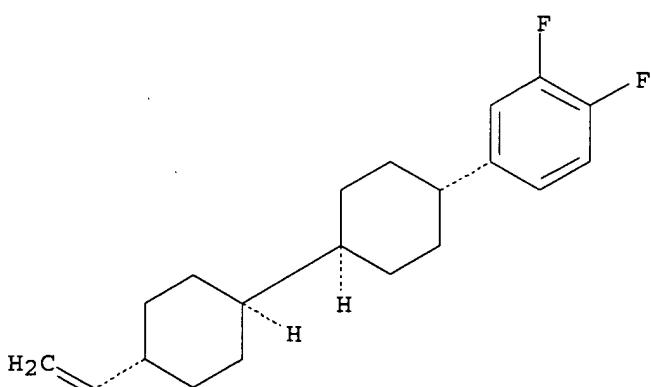
Relative stereochemistry.



CM 3

CRN 142400-92-8
CMF C20 H26 F2

Relative stereochemistry.



RN 247924-94-3 CAPLUS

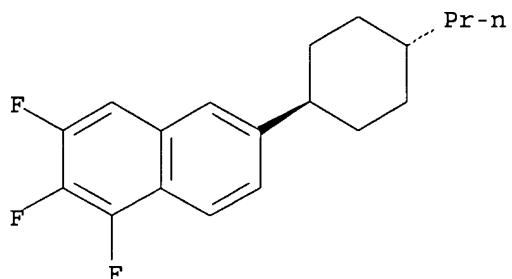
CN Naphthalene, 1,2,3-trifluoro-6-(trans-4-propylcyclohexyl)-, mixt. with 4-[(trans,trans)-4'-(3-butenyl)[1,1'-bicyclohexyl]-4-yl]-1,2-difluorobenzene and 4-[(trans,trans)-4'-ethenyl[1,1'-bicyclohexyl]-4-yl]-1,2-difluorobenzene (9CI) (CA INDEX NAME)

CM 1

CRN 247924-93-2

CMF C19 H21 F3

Relative stereochemistry.

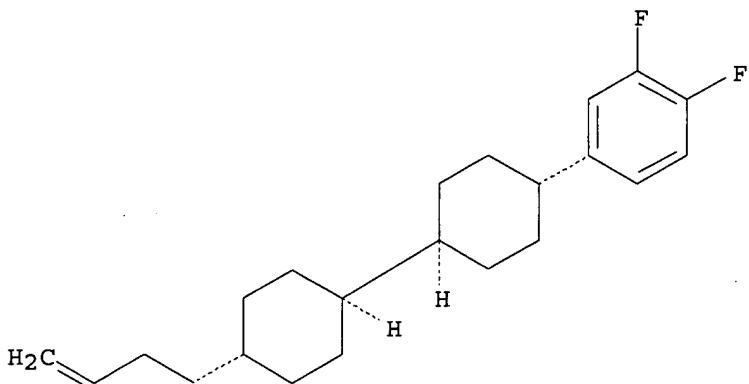


CM 2

CRN 155266-68-5

CMF C22 H30 F2

Relative stereochemistry.

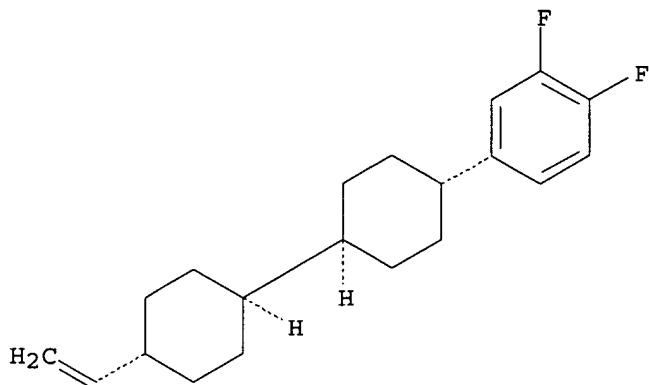


CM 3

CRN 142400-92-8

CMF C20 H26 F2

Relative stereochemistry.



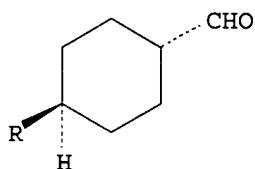
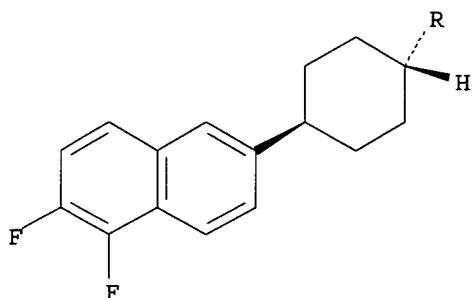
IT 247924-66-9P

RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses (prep. and reaction in synthesis of liq. crystals for electrooptical display devices)

RN 247924-66-9 CAPLUS

CN [1,1'-Bicyclohexyl]-4-carboxaldehyde, 4'--(5,6-difluoro-2-naphthalenyl)-, (trans,trans)- (9CI) (CA INDEX NAME)

Relative stereochemistry.



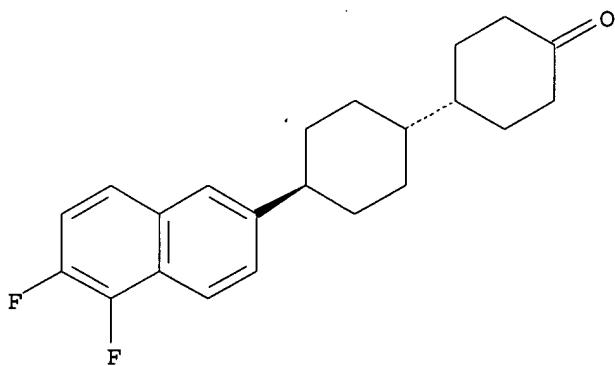
IT 247924-65-8

RL: RCT (Reactant); RACT (Reactant or reagent) (reaction in synthesis of liq. crystals for electrooptical display devices)

RN 247924-65-8 CAPLUS

CN [1,1'-Bicyclohexyl]-4-one, 4'--(5,6-difluoro-2-naphthalenyl)-, trans- (9CI) (CA INDEX NAME)

Relative stereochemistry.



IT 247924-59-0P 247924-60-3P 247924-64-7P

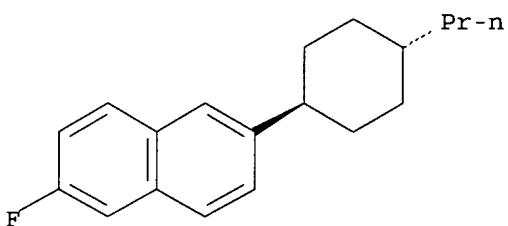
247924-67-0P

RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses (synthesis and use in prep. liq. crystal compns. for electrooptical display devices)

RN 247924-59-0 CAPLUS

CN Naphthalene, 2-fluoro-6-(trans-4-propylcyclohexyl)- (9CI) (CA INDEX NAME)

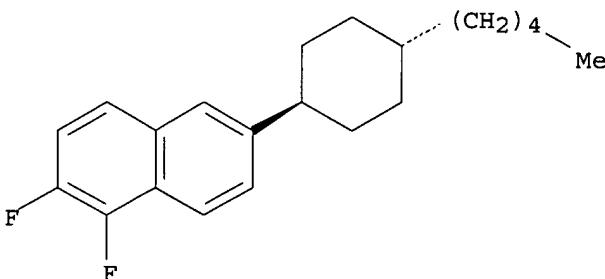
Relative stereochemistry.



RN 247924-60-3 CAPLUS

CN Naphthalene, 1,2-difluoro-6-(trans-4-pentylcyclohexyl)- (9CI) (CA INDEX NAME)

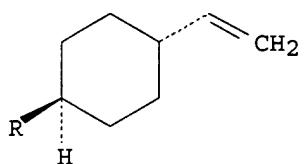
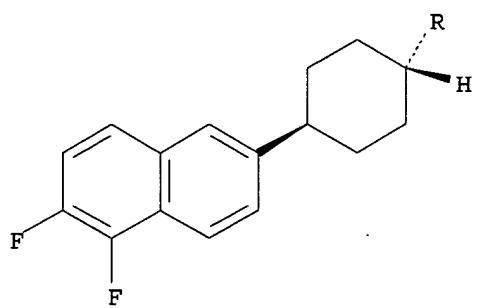
Relative stereochemistry.



RN 247924-64-7 CAPLUS

CN Naphthalene, 6-[(trans,trans)-4'-ethenyl[1,1'-bicyclohexyl]-4-yl]-1,2-difluoro- (9CI) (CA INDEX NAME)

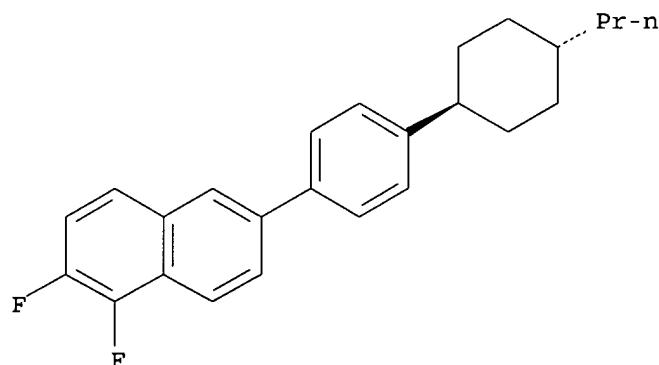
Relative stereochemistry.

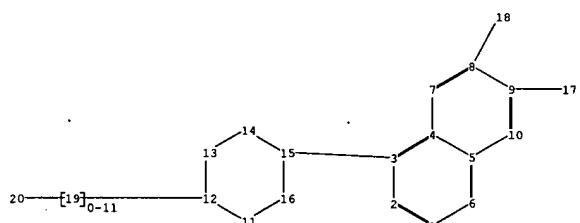
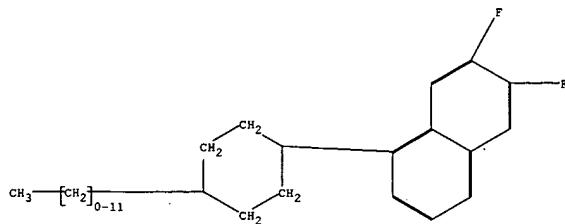


RN 247924-67-0 CAPLUS

CN Naphthalene, 1,2-difluoro-6-[4-(trans-4-propylcyclohexyl)phenyl]- (9CI)
(CA INDEX NAME)

Relative stereochemistry.





chain nodes :
 17 18 19 20

ring nodes :

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

chain bonds :

3-15 8-18 9-17 12-19 19-20

ring bonds :

1-2 1-6 2-3 3-4 4-5 4-7 5-6 5-10 7-8 8-9 9-10 11-12 11-16 12-13 13-14

14-15 15-16

exact/norm bonds :

11-12 11-16 12-13 13-14 14-15 15-16

exact bonds :

3-15 8-18 9-17 12-19 19-20

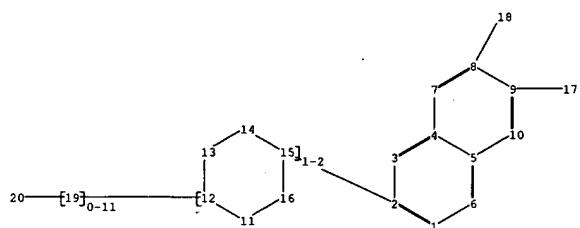
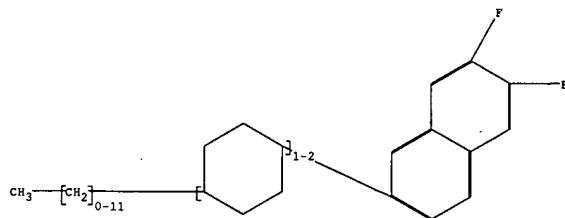
normalized bonds :

1-2 1-6 2-3 3-4 4-5 4-7 5-6 5-10 7-8 8-9 9-10

Match level :

1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom 11:Atom
 12:Atom 13:Atom 14:Atom 15:Atom 16:Atom 17:CLASS 18:CLASS 19:CLASS 20:CLASS

OK



chain nodes :

17 18 19 20

ring nodes :

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

chain bonds :

2-15 8-18 9-17 12-19 19-20

ring bonds :

1-2 1-6 2-3 3-4 4-5 4-7 5-6 5-10 7-8 8-9 9-10 11-12 11-16 12-13 13-14
14-15 15-16

exact/norm bonds :

11-12 11-16 12-13 13-14 14-15 15-16

exact bonds :

2-15 8-18 9-17 12-19 19-20

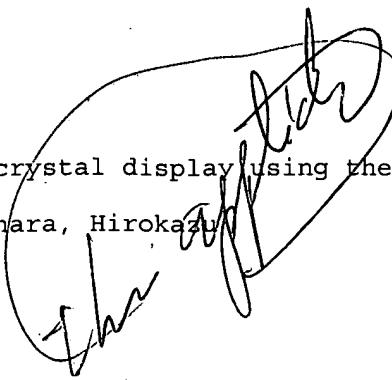
normalized bonds :

1-2 1-6 2-3 3-4 4-5 4-7 5-6 5-10 7-8 8-9 9-10

Match level :

1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom 11:Atom
12:Atom 13:Atom 14:Atom 15:Atom 16:Atom 17:CLASS 18:CLASS 19:CLASS 20:CLASS

AN 2000:210286 CAPLUS
 DN 132:258221
 TI Nematic liquid crystal composition and liquid crystal display using the same
 IN Takeuchi, Kiyofumi; Takatsu, Haruyoshi; Yanagihara, Hirokazu
 PA Dainippon Ink and Chemicals, Inc., Japan
 SO PCT Int. Appl., 355 pp.
 CODEN: PIXXD2



DT Patent
 LA Japanese
 IC ICM C09K019-32
 ICS C09K019-34; C09K019-40; C09K019-42; G02F001-13
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
 Section cross-reference(s): 75

FAN.CNT 1

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PI	WO 2000017287	A1	20000330	WO 1999-JP4918	19990910
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	RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
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	JP 2000336363	A2	20001205	JP 1999-150024	19990528
	JP 2001072974	A2	20010321	JP 1999-222046	19990805
	CA 2344667	AA	20000330	CA 1999-2344667	19990910
	AU 9956489	A1	20000410	AU 1999-56489	19990910
	EP 1116770	A1	20010718	EP 1999-943250	19990910
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	JP 1999-150024	A	19990528		
	JP 1999-187087	A	19990630		
	WO 1999-JP4918	W	19990910		
OS	MARPAT 132:258221				
GI					

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

AB A nematic liq. crystal compn. characterized in that the liq. crystal compn. comprises a compd. represented by any of general formulas I-V (R1 = C1-10 alkyl, C2-10 alkenyl; Q1 = F, Cl, OCF3, etc.; X1-3 = H, F, Cl, OCF3, CN; W1-6 = H, F, Cl, OCF3, CN; K1-5 = -COO-, -OCO-, -CH2O-, etc.; ring A1-4 = 1,4 phenylene, 2-or 3-fluoro-1,4-phenylene, 2,3-difluoro-1,4-phenylene, etc.) which have naphthalene-2,6-diyl, decahydronaphthalene-2,6-diyl or 1,2,3,4-tetrahydronaphthalene-2,6-diyl; and a liq. crystal display using the same. This nematic liq. crystal compn. allows the extension of the operation temp. range for a liq. crystal display characteristic through, for example, its improvement in compatibility and in storage stability at a low temp., permits the redn. of driving voltage and the improvement of its change with temp. and enables achieving a relatively fast response for a given driving voltage, and accordingly is extremely suitable for use in TN, STN, TFT, IPS, MVA, OCB, ECB, PC, PNLC, PDLC, PSCt or the like.

ST nematic liq crystal compn display

IT Liquid crystal displays
 (nematic liq. crystal compn. and liq. crystal display using same)
 IT Liquid crystals
 (nematic; nematic liq. crystal compn. and liq. crystal display using same)
 IT 39969-28-3 39969-29-4 40817-08-1 54211-46-0 59855-03-7
 59855-05-9 61203-99-4 82832-58-4 86776-50-3 86776-51-4
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RL: DEV (Device component use); USES (Uses)
 (nematic liq. crystal compn.)

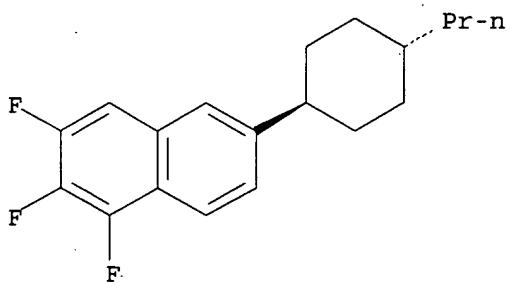
RE.CNT 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Cereghetti, M; Helvetica Chimica Acta 1982, V65(4), P1318 CAPLUS
- (2) Chisso Corporation; EP 205340 A1 CAPLUS
- (3) Chisso Corporation; EP 656412 A1 CAPLUS
- (4) Chisso Corporation; JP 59141527 A 1984 CAPLUS
- (5) Chisso Corporation; JP 61134364 A 1986 CAPLUS
- (6) Chisso Corporation; JP 61282345 A 1986 CAPLUS
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- (9) Dainippon Ink And Chemicals Inc; JP 959623 A 1997
- (10) Dainippon Ink And Chemicals Inc; JP 11302207 A 1999 CAPLUS
- (11) Hoffmann-La Roche Inc; GB 2082179 A1 CAPLUS
- (12) Hoffmann-La Roche Inc; US 4391731 A CAPLUS
- (13) Hoffmann-La Roche Inc; EP 47817 A1 CAPLUS

(14) Hoffmann-La Roche Inc; JP 5754130 A 1982
(15) Lobko, T; Liquid Crystals 1993, V15(3), P361 CAPLUS
(16) Merck Patent GmbH; DE 3837208 A1 CAPLUS
(17) Merck Patent GmbH; DE 4032579 A CAPLUS
(18) Merck Patent GmbH; EP 481293 A1 CAPLUS
(19) Merck Patent GmbH; US 5084204 A CAPLUS
(20) Merck Patent GmbH; US 5374374 A CAPLUS
(21) Merck Patent GmbH; US 5942648 A CAPLUS
(22) Merck Patent GmbH; JP 01160924 A 1989 CAPLUS
(23) Merck Patent GmbH; JP 04283291 A 1992 CAPLUS
(24) Merck Patent GmbH; GB 2271771 A1 1994 CAPLUS
(25) Pavluchenko, A; Mol Cryst Liq Cryst 1991, V209, P225 CAPLUS
(26) Sharp Corporation; US 5523127 A CAPLUS
(27) Sharp Corporation; EP 575791 A1 CAPLUS
(28) Sharp Corporation; JP 05341273 A 1993 CAPLUS
(29) The Secretary Of State For Defense In Her Britannic Majesty'S Government Of The United Kingdom Of Great Britain And Northern Ireland; GB 2238309 A CAPLUS
(30) The Secretary Of State For Defense In Her Britannic Majesty'S Government Of The United Kingdom Of Great Britain And Northern Ireland; FR 2361455 A1 CAPLUS
(31) The Secretary Of State For Defense In Her Britannic Majesty'S Government Of The United Kingdom Of Great Britain And Northern Ireland; DE 2736525 A1 CAPLUS
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(36) The Secretary Of State For Defense In Her Britannic Majesty'S Government Of The United Kingdom Of Great Britain And Northern Ireland; JP 5322882 A 1978
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(38) Vill, V; J Mater Chem 1997, V7, P893 CAPLUS
IT 247924-93-2 262604-14-8 262604-16-0
262604-17-1 262604-36-4 262604-41-1
262604-42-2 262604-47-7 262604-48-8
262604-49-9
RL: DEV (Device component use); USES (Uses)
(nematic liq. crystal compn.)
RN 247924-93-2 CAPLUS
CN Naphthalene, 1,2,3-trifluoro-6-(trans-4-propylcyclohexyl)- (9CI) (CA INDEX NAME)

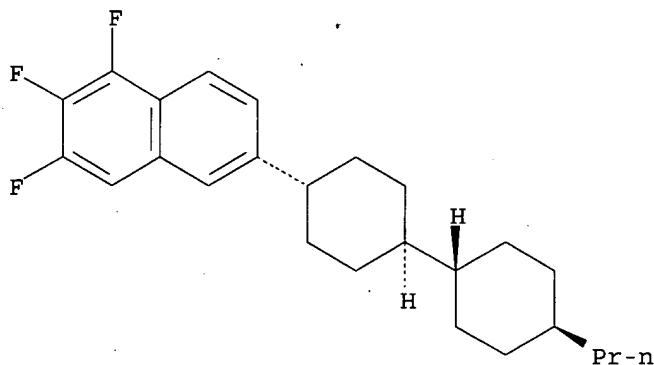
Relative stereochemistry.



RN 262604-14-8 CAPLUS

CN Naphthalene, 1,2,3-trifluoro-6-[(trans,trans)-4'-propyl[1,1'-bicyclohexyl]-4-yl]- (9CI) (CA INDEX NAME)

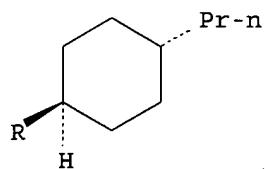
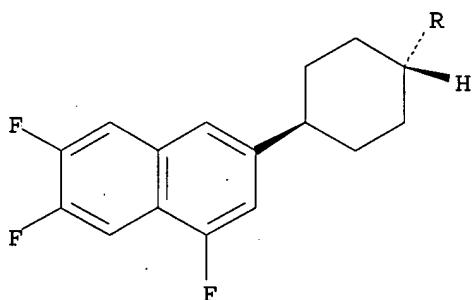
Relative stereochemistry.



RN 262604-16-0 CAPLUS

CN Naphthalene, 1,6,7-trifluoro-3-[(trans,trans)-4'-propyl[1,1'-bicyclohexyl]-4-yl]- (9CI) (CA INDEX NAME)

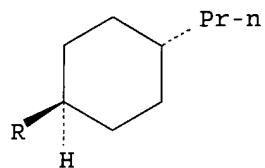
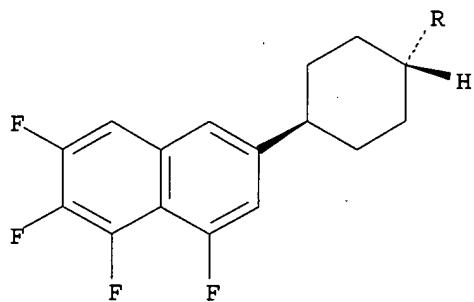
Relative stereochemistry.



RN 262604-17-1 CAPLUS

CN Naphthalene, 1,2,3,8-tetrafluoro-6-[(trans,trans)-4'-propyl[1,1'-bicyclohexyl]-4-yl]- (9CI) (CA INDEX NAME)

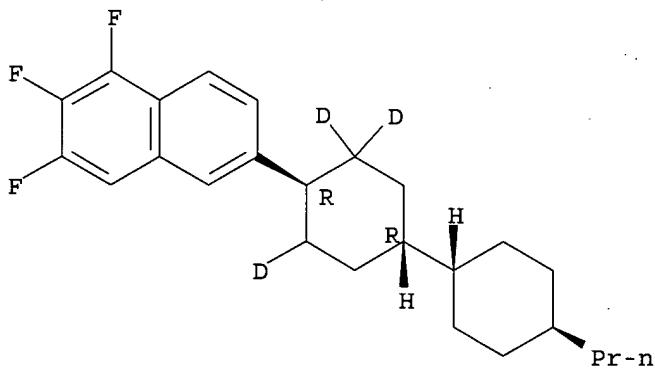
Relative stereochemistry.



RN 262604-36-4 CAPLUS

CN Naphthalene, 1,2,3-trifluoro-6-[(1R,1'.alpha.,4R,4'.beta.)-4'-propyl[1,1'-bicyclohexyl]-4-yl-3,3,5-d3]- (9CI) (CA INDEX NAME)

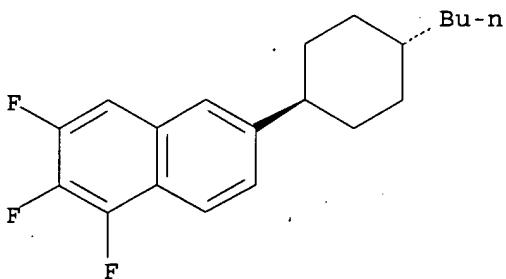
Relative stereochemistry.



RN 262604-41-1 CAPLUS

CN Naphthalene, 6-(trans-4-butylcyclohexyl)-1,2,3-trifluoro- (9CI) (CA INDEX NAME)

Relative stereochemistry.

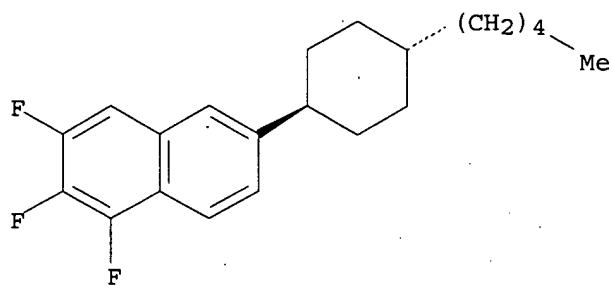


RN 262604-42-2 CAPLUS

CN Naphthalene, 1,2,3-trifluoro-6-(trans-4-pentylcyclohexyl)- (9CI) (CA

INDEX NAME)

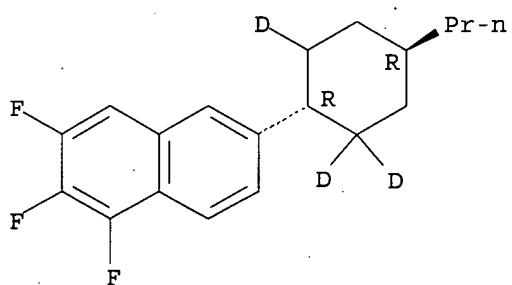
Relative stereochemistry.



RN 262604-47-7 CAPLUS

CN Naphthalene, 1,2,3-trifluoro-6-[(1R,4R)-4-propylcyclohexyl-2,2,6-d3]-, rel- (9CI) (CA INDEX NAME)

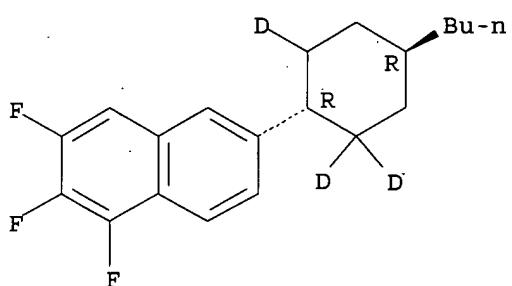
Relative stereochemistry.



RN 262604-48-8 CAPLUS

CN Naphthalene, 6-[(1R,4R)-4-butylcyclohexyl-2,2,6-d3]-1,2,3-trifluoro-, rel- (9CI) (CA INDEX NAME)

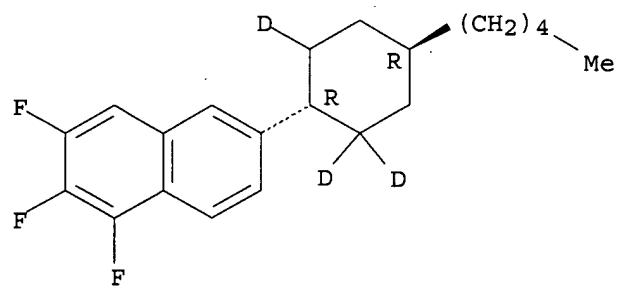
Relative stereochemistry.

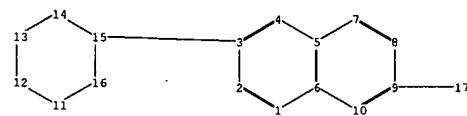
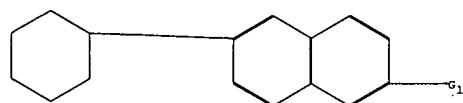


RN 262604-49-9 CAPLUS

CN Naphthalene, 1,2,3-trifluoro-6-[(1R,4R)-4-pentylcyclohexyl-2,2,6-d3]-, rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.





chain nodes :

17

ring nodes :

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

chain bonds :

3-15 9-17
14-15 15-16

ring bonds :

1-2 1-6 2-3 3-4 4-5 5-6 5-7 6-10 7-8 8-9 9-10 11-12 11-16 12-13 13-14

exact/norm bonds :

9-17 11-12 11-16 12-13 13-14 14-15 15-16

exact bonds :

3-15

normalized bonds :

1-2 1-6 2-3 3-4 4-5 5-6 5-7 6-10 7-8 8-9 9-10

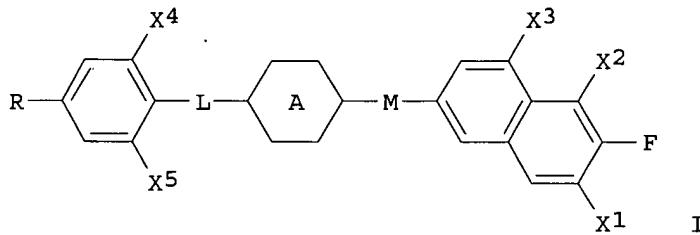
G1:CF2,CF3,CN,F,I

Match level :

1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom 11:Atom
12:Atom 13:Atom 14:Atom 15:Atom 16:Atom 17:CLASS

AN 2000:905582 CAPLUS
 DN 134:63987
 TI Novel 2-fluoronaphthalene derivative liquid crystals, liquid crystal compositions, and liquid crystal devices
 IN Takehara, Sadao; Negishi, Makoto; Ogawa, Shinji; Kawahara, Tatsuo; Takatsu, Haruyoshi
 PA Dainippon Ink and Chemicals, Inc., Japan
 SO Jpn. Kokai Tokkyo Koho, 48 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM C07C025-22
 ICS C09K019-32; C09K019-34
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
 Section cross-reference(s): 25, 75
 FAN.CNT 1
 PATENT NO. KIND DATE APPLICATION NO. DATE

 PI JP 2000355560 A2 20001226 JP 1999-168137 19990615
 PRAI JP 1999-168137 19990615
 OS MARPAT 134:63987
 GI



AB Novel 2-fluoronaphthalene deriv. I (R = C1-20 alkyl, alkoxy, alkoxyalkyl, alkenyl, alkenyloxy, which may be substituted with C1-7 alkoxy or .gtoreq.1 F; A = trans-1,4-cyclohexylene, 1,4-phenylene, 2-fluoro-1,4-phenylene, 2,6-difluoro-1,4-phenylene, pyridine-2,5-diyl, pyrimidine-2,5-diyl, pyrazine-2,5-diyl, pyridazine-3,6-diyl, trans-1,3-dioxane-2,5-diyl, naphthalene-2,6-diyl, 1,2,3,4-tetrahydronaphthalene-2,6-diyl, decahydronaphthalene-2,6-diyl, single bond; L, M = CH₂CH₂, CH₂CH₂CH₂CH₂, CMeCH, CHCMe, single bond; X1-5 = H, F; at least 1 of X1, X2, and X3 is F) is claimed. Liq. crystal compns. contg. I and liq. crystal devices, e.g. active matrix display devices, comprising of the compns. are also claimed.
 ST fluoronaphthalene deriv liq crystal; liq crystal display device
 fluoronaphthalene deriv
 IT Liquid crystal displays
 Liquid crystals
 (fluoronaphthalene derivs. as liq. crystals and their use in display devices)
 IT 313947-22-7P 313947-23-8P 313947-24-9P
 313947-25-0P 313947-26-1P 313947-27-2P 313947-28-3P
 313947-29-4P 313947-30-7P
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (fluoronaphthalene derivs. as liq. crystals and their use in display devices)
 IT 40817-08-1D, liq. crystal compns. contg. 56131-48-7D, liq. crystal compns. contg. 59855-05-9D, liq. crystal compns. contg. 61203-99-4D, liq. crystal compns. contg. 67589-39-3D, liq. crystal compns. contg. 79709-85-6D, liq. crystal compns. contg. 80944-44-1D, liq. crystal

compns. contg. 86776-52-5D, liq. crystal compns. contg. 92118-82-6D, liq. crystal compns. contg. 94412-40-5D, liq. crystal compns. contg. 94737-82-3D, liq. crystal compns. contg. 95480-29-8D, liq. crystal compns. contg. 95906-34-6D, liq. crystal compns. contg. 96624-52-1D, liq. crystal compns. contg. 107949-21-3D, liq. crystal compns. contg. 118164-50-4D, liq. crystal compns. contg. 129738-34-7D, liq. crystal compns. contg. 131819-23-3D, liq. crystal compns. contg. 131819-25-5D, liq. crystal compns. contg. 132123-39-8D, liq. crystal compns. contg. 136159-73-4D, liq. crystal compns. contg. 142400-92-8D, liq. crystal compns. contg. 145918-41-8D, liq. crystal compns. contg. 153280-45-6D, liq. crystal compns. contg. 155041-85-3D, liq. crystal compns. contg. 156243-60-6D, liq. crystal compns. contg. 184161-94-2D, liq. crystal compns. contg. 189387-74-4D, liq. crystal compns. contg. 202652-64-0D, liq. crystal compns. contg. 313947-37-4D, liq. crystal compns. contg. 313947-38-5

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(fluoronaphthalene derivs. as liq. crystals and their use in display devices)

IT 156641-98-4P 247924-46-5P 313947-31-8P 313947-32-9P 313947-33-0P
313947-39-6P

RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(fluoronaphthalene derivs. as liq. crystals and their use in display devices)

IT 74-85-1, Ethylene, reactions 588-93-2 5467-58-3 62452-73-7
91174-92-4, 4-(4-Propylphenyl)cyclohexanone 117960-51-7 126261-84-5
209991-62-8 313947-34-1 313947-35-2 313947-36-3

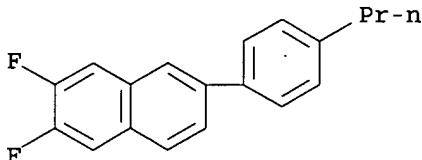
RL: RCT (Reactant); RACT (Reactant or reagent)
(fluoronaphthalene derivs. as liq. crystals and their use in display devices)

IT 313947-23-8P 313947-24-9P 313947-25-0P
313947-27-2P

RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(fluoronaphthalene derivs. as liq. crystals and their use in display devices)

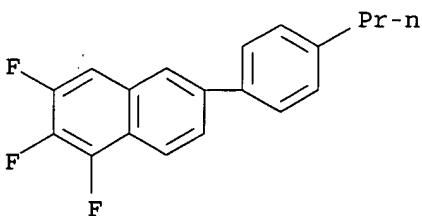
RN 313947-23-8 CAPLUS

CN Naphthalene, 2,3-difluoro-6-(4-propylphenyl)- (9CI) (CA INDEX NAME)



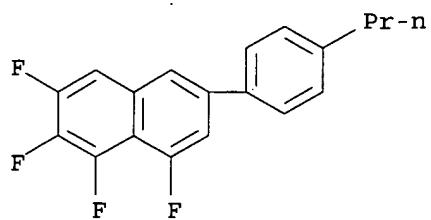
RN 313947-24-9 CAPLUS

CN Naphthalene, 1,2,3-trifluoro-6-(4-propylphenyl)- (9CI) (CA INDEX NAME)



RN 313947-25-0 CAPLUS

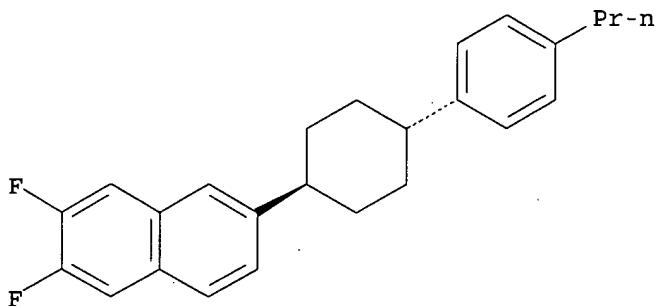
CN Naphthalene, 1,2,3,8-tetrafluoro-6-(4-propylphenyl)- (9CI) (CA INDEX
NAME)



RN 313947-27-2 CAPLUS

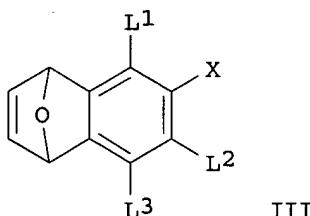
CN Naphthalene, 2,3-difluoro-6-[trans-4-(4-propylphenyl)cyclohexyl]- (9CI)
(CA INDEX NAME)

Relative stereochemistry.



L7 ANSWER 1 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
 AN 2003:409012 CAPLUS
 DN 138:401503
 TI Preparation of naphthalenes for use as liquid crystals or mesogenic compounds
 IN Poetsch, Eike; Meyer, Volker
 PA Merck Patent GmbH, Germany
 SO Ger. Offen., 50 pp.
 CODEN: GWXXBX
 DT Patent
 LA German
 IC ICM C07D407-02
 ICS C07C025-18; C07C015-24; C07C043-225; C07C069-76; C09K019-20
 CC 25-24 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
 Section cross-reference(s): 75
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI DE 10251017	A1	20030528	DE 2002-10251017	20021102
PRAI DE 2001-10158082	IA	20011127		
OS MARPAT 138:401503				
GI				



AB Title compds. $R_1-(A_1-Z_1)m_1-(A_2-Z_2)m_2-W-(Z_3-A_3)m_3-(Z_4-A_4)-R_2$ (I) [$W =$ (un)substituted naphthalene, 1,2,3,4-tetrahydronaphthalene; $R_1, R_2 = H$, halo, CN, etc.; $A_1, A_2, A_3, A_4 = 1,4\text{-cyclohexylene, 1,4\text{-phenylene, piperidin-1,4-diyl, etc.}; } Z_1, Z_2, Z_3, Z_4 = -COO-, -OCO-, -CF_2O-, etc.}; m_1, m_2, m_3, m_4 = 0-2; X = -(Z_3-A_3)m_3-(Z_4-A_4)m_4-R_2; M = Li, Na, K, etc.]$ were prep'd. via the nucleophilic addn. of $R_1-(A_1-Z_1)m_1-(A_2-Z_2)m_2-M$ (II) to 1,4-epoxynaphthalenes III, followed by acid catalyzed dehydroaromatization is disclosed. Approx., 79-examples of compds. I with phase data are provided. Compds. I are claimed useful for the prodn. of liq. crystals or mesogenic compds.
 ST prep'n naphthalene liq crystal epoxide dehydroaromatization
 IT Ring opening
 (nucleophilic; prep'n. of naphthalenes for use as liq. crystals or mesogenic compds.)
 IT Aromatization
 Liquid crystals
 (prep'n. of naphthalenes for use as liq. crystals or mesogenic compds.)
 IT Epoxides
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
 (unsatd.; prep'n. of naphthalenes for use as liq. crystals or mesogenic compds.)
 IT 18099-90-6P 19061-33-7P 173276-82-9P 173276-84-1P 173276-99-8P
 531529-80-3P 531529-84-7P 531529-87-0P 531529-90-5P 531529-94-9P
 531529-98-3P 531530-02-6P 531530-06-0P 531530-17-3P 531530-22-0P
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
 (intermediate; prep'n. of naphthalenes for use as liq. crystals or mesogenic compds.)

IT 110-00-9, Furan 119-64-2 348-57-2 348-61-8 17903-36-5 64695-78-9
 115467-07-7 138526-69-9 204654-92-2 531529-35-8 531529-39-2
 531529-43-8 531529-46-1 531529-49-4 531529-52-9 531529-58-5
 531529-72-3

RL: RCT (Reactant); RACT (Reactant or reagent)

(prepn. of naphthalenes for use as liq. crystals or mesogenic compds.)

IT 573-57-9P 247924-38-5P 247924-58-9P 247924-78-3P 247924-99-8P
 262604-89-7P 264281-68-7P 313947-23-8P 313947-37-4P
 315691-01-1P 315691-10-2P 318995-73-2P 349489-87-8P 392729-16-7P
 402755-47-9P 478272-49-0P 478272-50-3P 531526-90-6P 531526-93-9P
 531526-96-2P 531526-99-5P 531527-04-5P 531527-07-8P 531527-10-3P
 531527-13-6P 531527-15-8P 531527-19-2P 531527-23-8P 531527-30-7P
 531527-32-9P 531527-35-2P 531527-38-5P 531527-41-0P 531527-42-1P
 531527-45-4P 531527-46-5P 531527-53-4P 531527-58-9P 531527-61-4P
 531527-65-8P 531527-70-5P 531527-75-0P 531527-80-7P 531527-83-0P
 531527-85-2P 531527-87-4P 531527-89-6P 531527-90-9P 531527-92-1P
 531527-94-3P 531527-96-5P 531527-98-7P 531528-00-4P 531528-01-5P
 531528-04-8P 531528-07-1P 531528-12-8P 531528-21-9P 531528-24-2P
 531528-31-1P 531528-33-3P 531528-42-4P 531528-45-7P 531528-49-1P
 531528-52-6P 531528-55-9P 531528-58-2P 531528-63-9P 531528-66-2P
 531528-68-4P 531528-71-9P 531528-82-2P 531528-86-6P 531528-90-2P
 531528-94-6P 531528-98-0P 531529-02-9P 531529-07-4P 531529-21-2P
 531529-25-6P

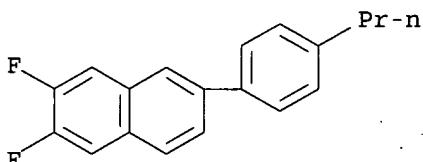
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (product; prepn. of naphthalenes for use as liq. crystals or mesogenic
 compds.)

IT 313947-23-8P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (product; prepn. of naphthalenes for use as liq. crystals or mesogenic
 compds.)

RN 313947-23-8 CAPLUS

CN Naphthalene, 2,3-difluoro-6-(4-propylphenyl)- (9CI) (CA INDEX NAME)



L7 ANSWER 2 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:587811 CAPLUS

DN 137:302061

TI Applications of new fluorinated liquid crystals of fused ring systems for active matrix LCD

AU Iwashita, Yoshinori; Umezawa, Yasuo; Takeuchi, Kiyofumi; Takatsu, Haruyoshi

CS Department of Materials for Liquid Crystal, Dainihon Ink and Chemicals, Inc., Japan

SO DIC Technical Review (2002), 8, 39-42

CODEN: DTREFW; ISSN: 1341-3201

PB Dainippon Inki Kagaku Kogyo K.K.

DT Journal

LA English

CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 75

AB The authors prepd. new series of liq. crystals (LC) of fused ring systems. LC mixts. using these materials had low birefringence and were used for reflective active-matrix (AM) liq. crystal displays (LCD). These materials show very quick response time of 10 ms and are suitable for AM-LCD-TV.

ST fluorinated fused ring system liq crystal active matrix LCD; reflective liq crystal display fluorinated hydronaphthalene naphthalene deriv
 IT Birefringence
 Thermal stability
 Viscoelasticity
 (liq. crystal mixts. contg. fluorinated hydronaphthalene- and naphthalene-deriv. components for active-matrix reflective LCD and LCD-TV applications)
 IT Television
 (liq. crystal; fluorinated hydronaphthalene- and naphthalene-deriv. liq. crystals and mixts. contg. them for active matrix LCD and LCD-TV applications)
 IT Phase transition temperature
 (nematic-isotropic; properties of fluorinated hydronaphthalene- and naphthalene-deriv. liq. crystals and mixts. contg. them for active matrix LCD and LCD-TV applications)
 IT Dielectric anisotropy
 Liquid crystals
 (properties of fluorinated hydronaphthalene- and naphthalene-deriv. liq. crystals and mixts. contg. them for active matrix LCD and LCD-TV applications)
 IT Liquid crystal displays
 (reflective; liq. crystal mixts. contg. fluorinated hydronaphthalene- and naphthalene-deriv. components for active-matrix reflective LCD and LCD-TV applications)
 IT 247924-91-0 **247924-93-2 262604-14-8** 262852-95-9
 347384-23-0 412323-72-9
 RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
 (fluorinated hydronaphthalene- and naphthalene-deriv. liq. crystals and mixts. contg. them for active matrix LCD and LCD-TV applications)
 IT 412323-73-0 **468756-85-6**
 RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
 (liq. crystal mixts. contg. fluorinated hydronaphthalene- and naphthalene-deriv. components for active-matrix reflective LCD and LCD-TV applications)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Iwashita, Y; Mol Cryst Liq Cryst Proc ILCC 2000 2001, V364, P851 CAPLUS
- (2) Iwashita, Y; SID Intl Symp Digest Tech Papers 2001, V32, P959
- (3) Nagashima, Y; Mol Cryst Liq Cryst Proc ILCC 2000 2001, V364, P859 CAPLUS
- (4) Negishi, M; Mol Cryst Liq Cryst Proc ILCC 2000 2001, V364, P865 CAPLUS

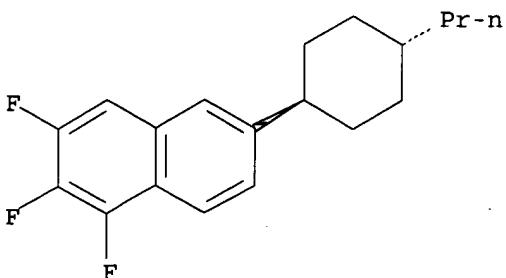
IT **247924-93-2 262604-14-8**

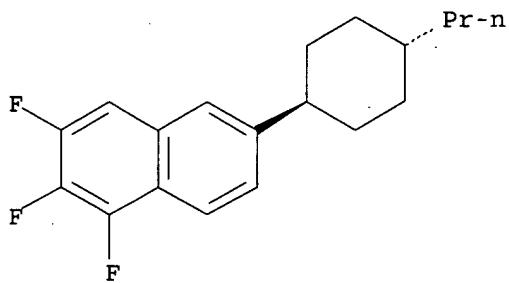
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
 (fluorinated hydronaphthalene- and naphthalene-deriv. liq. crystals and mixts. contg. them for active matrix LCD and LCD-TV applications)

RN 247924-93-2 CAPLUS

CN Naphthalene, 1,2,3-trifluoro-6-(trans-4-propylcyclohexyl)- (9CI) (CA INDEX NAME)

Relative stereochemistry.

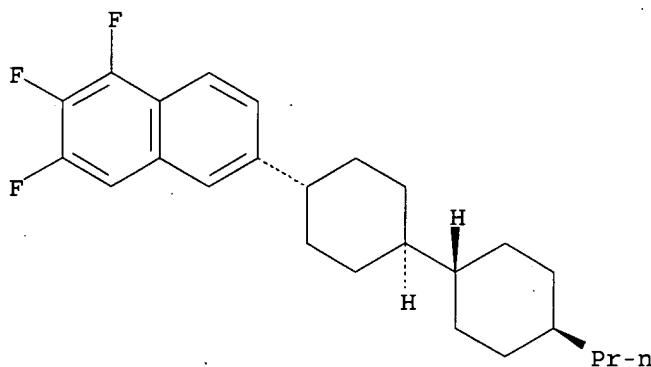




RN 262604-14-8 CAPLUS

CN Naphthalene, 1,2,3-trifluoro-6-[(trans,trans)-4'-propyl[1,1'-bicyclohexyl]-4-yl]- (9CI) (CA INDEX NAME)

Relative stereochemistry.



IT 468756-85-6

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(liq. crystal mixts. contg. fluorinated hydronaphthalene- and naphthalene-deriv. components for active-matrix reflective LCD and LCD-TV applications)

RN 468756-85-6 CAPLUS

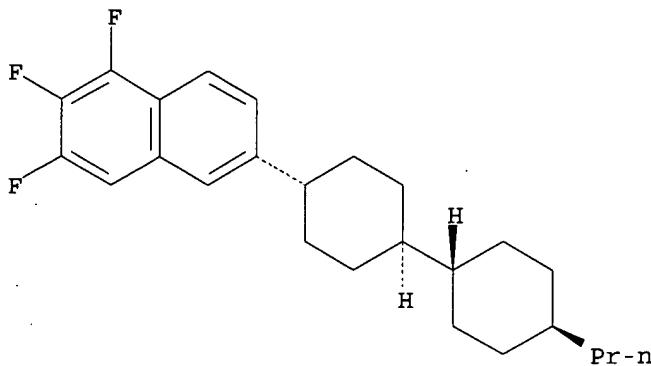
CN Naphthalene, 1,2,3-trifluoro-6-[(trans,trans)-4'-propyl[1,1'-bicyclohexyl]-4-yl]-, mixt. with 1,2-difluoro-6-(trans-4-propylcyclohexyl)naphthalene and 1,2,3-trifluoro-6-(trans-4-propylcyclohexyl)naphthalene (9CI) (CA INDEX NAME)

CM 1

CRN 262604-14-8

CMF C25 H31 F3

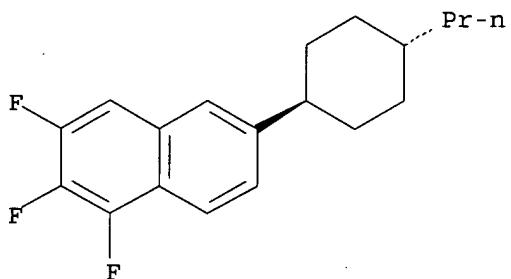
Relative stereochemistry.



CM 2

CRN 247924-93-2
CMF C19 H21 F3

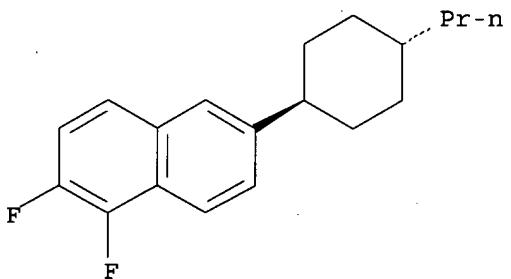
Relative stereochemistry.



CM 3

CRN 247924-91-0
CMF C19 H22 F2

Relative stereochemistry.



L7 ANSWER 3 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2002:25845 CAPLUS

DN 136:69655

TI Method for preparation of 1,2,3,4-tetrahydronaphthalene derivatives by catalytic hydrogenation of naphthalene derivatives

IN Ogawa, Shinji; Kusumoto, Akio; Takehara, Sadao; Takatsu, Haruyoshi

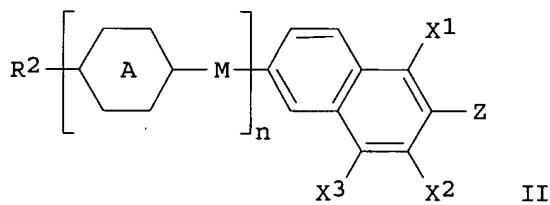
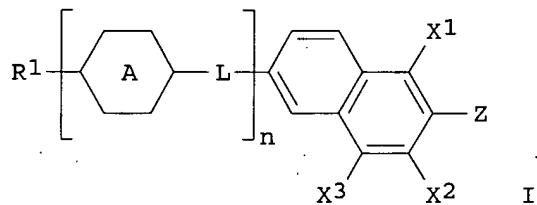
PA Dainippon Ink and Chemicals, Inc., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM C07C017-354
 ICS C07C025-22; C07B061-00
 CC 25-24 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
 Section cross-reference(s): 75

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002003416	A2	20020109	JP 2000-191159	20000626
PRAI	JP 2000-191159		20000626		
OS	CASREACT 136:69655; MARPAT 136:69655				
GI					



AB Naphthalene derivs. [I; R1 = H, C1-15 alkyl or C2-15 alkenyl which is either racemic or optically active and optionally substituted by at least one F or C1-5 alkyl and optionally has one or .gtoreq.2 nonadjacent CH2 groups replaced with O or S; the ring A = trans-1,4-cyclohexylene (where one or .gtoreq.2 nonadjacent CH2 groups in the group A is optionally replaced with O or S), 1,4-phenylene optionally substituted by 1 or 2 F atom(s), trans-1,3-dioxane-2,5-diyl, trans-decahydronaphthalene-2,6-diyl, or bicyclo[2.2.2]octane-1,4-diyl, where each group is optionally substituted by C1-3 alkyl or F; L = CH2CH2, CH:CH, CHMeCH2, CH2CHMe, CHMeCHMe, (CH2)4, or C.tplbond.C; n = 0,1,2; X1, X2, X3 = H, F; Z = R1, H, F, CF3O, difluoromethoxy; plural no. of groups in ring A or L are same or different; when X1 is F, one of X2 and X3 is F] are hydrogenated to give 1,2,3,4-tetrahydronaphthalene derivs. [II; R2 = group listed in R1, excluding C2-15 alkenyl; M = CH2CH2, CHMeCH2, CH2CHMe, CHMeCHMe, (CH2)4; n, X1, X2, X3, Z = same as above]. The redn. is carried out using at least one hydrogenation catalyst selected from Ru, Pt, Pd, Re, Ir, Os, or metal compds. thereof. This process inexpensively gives in a simple procedure the compds. II of good quality which are either difficult or complicated to prep. previously. These compds. II are useful as liq. crystal materials (no data). Thus, 10 g 6-(trans-4-propylcyclohexyl)-1,2,3-trifluoronaphthalene, 1 g 5% Pd-C contg. 50% H2O, and 100 mL ethanol were added to an autoclave and stirred at 80.degree. under hydrogen pressure of 5 atm for 14 to give, after silica gel chromatog., 9.3 g 2-(trans-4-propylcyclohexyl)-5,6,7-trifluoro-1,2,3,4-tetrahydronaphthalene (95% purity).

ST tetrahydronaphthalene prepn liq crystal; propylcyclohexyltrifluorotetrahydronaphthalene prepn liq crystal; naphthalene catalytic hydrogenation; palladium hydrogenation catalyst

IT Hydrogenation
 Hydrogenation catalysts
 Liquid crystals
 (method for prepn. of tetrahydronaphthalene derivs. as liq. crystals by catalytic hydrogenation of naphthalene derivs. in presence of palladium)

IT 7439-88-5, Iridium, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses 7440-05-3D, Palladium, supported on carbon 7440-06-4, Platinum, uses 7440-15-5, Rhenium, uses 7440-18-8, Ruthenium, uses
 RL: CAT (Catalyst use); USES (Uses)
 (method for prepn. of tetrahydronaphthalene derivs. as liq. crystals by catalytic hydrogenation of naphthalene derivs. in presence of palladium)

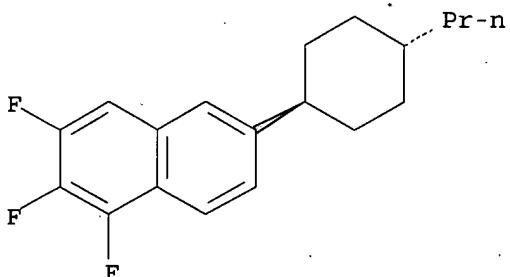
IT 324801-18-5P 383910-84-7P
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (method for prepn. of tetrahydronaphthalene derivs. as liq. crystals by catalytic hydrogenation of naphthalene derivs. in presence of palladium)

IT 247924-93-2, 6-(trans-4-Propylcyclohexyl)-1,2,3-trifluoronaphthalene 383910-83-6, 1,2-Difluoro-3-ethyl-7-(trans-4-propylcyclohexyl)naphthalene
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (method for prepn. of tetrahydronaphthalene derivs. as liq. crystals by catalytic hydrogenation of naphthalene derivs. in presence of palladium)

IT 247924-93-2, 6-(trans-4-Propylcyclohexyl)-1,2,3-trifluoronaphthalene
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (method for prepn. of tetrahydronaphthalene derivs. as liq. crystals by catalytic hydrogenation of naphthalene derivs. in presence of palladium)

RN 247924-93-2 CAPLUS
 CN Naphthalene, 1,2,3-trifluoro-6-(trans-4-propylcyclohexyl)- (9CI) (CA INDEX NAME)

Relative stereochemistry.



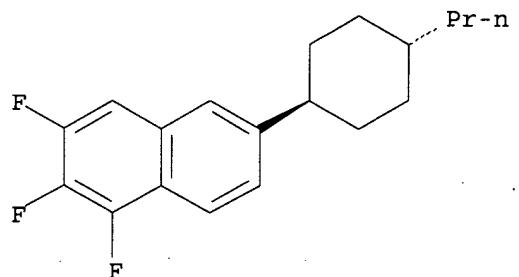
L7 ANSWER 4 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
 AN 2001:811869 CAPLUS
 DN 136:142503
 TI Design, synthesis and physical properties of new liquid crystal materials for active matrix LCD. New aromatic ring systems prepared by regioselective fluorination as new mesogens containing fluorines
 AU Negishi, Makoto; Ogawa, Shinji; Osawa, Masashi; Kawara, Tatsuo; Kusumoto, Tetsuo; Takeuchi, Kiyofumi; Takehara, Sadao; Takatsu, Haruyoshi
 CS Liquid Crystal Materials Division, Dainippon Ink and Chemicals, Inc., Saitama, 362-8577, Japan
 SO Molecular Crystals and Liquid Crystals Science and Technology, Section A: Molecular Crystals and Liquid Crystals (2001), 364, 865-872
 CODEN: MCLCE9; ISSN: 1058-725X

PB Gordon & Breach Science Publishers
DT Journal
LA English
CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB Novel 1-fluoro- and 1,2-difluoronaphthalene derivs. were designed for active matrix LCD and were prep'd. through the regioselective fluorination of 6-substituted 2-naphthols. These compds. exhibited high nematic-isotropic transition temps. with very large dielec. anisotropy and large birefringences. These results are useful for design of new liq. crystal mixts. for TFT-displays.
ST synthesis design fluoronaphthalene deriv liq crystal active matrix display; regioselective fluorination fluoronaphthalene deriv liq crystal active matrix LCD
IT Liquid crystal displays
(active matrix; design and synthesis and properties of fluoronaphthalene deriv. liq. crystals for active matrix displays)
IT Birefringence
Dielectric constant
Phase transition temperature
(design and synthesis and properties of fluoronaphthalene deriv. liq. crystals for active matrix displays)
IT Fluorination
(regioselective; synthesis of fluoronaphthalene deriv. liq. crystals)
IT 247924-38-5P 247924-41-0P 247924-99-8P 262604-12-6P 262604-58-0P
264281-68-7P 313947-37-4P 392729-16-7P
RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)
(design and synthesis and properties of fluoronaphthalene deriv. liq. crystals for active matrix displays)
IT 247924-92-1 **247924-94-3** 247924-97-6 247924-98-7
247925-00-4 313947-38-5 392729-20-3 392729-23-6 392729-25-8
392729-27-0 392729-31-6 392729-33-8 392729-36-1 392729-38-3
RL: PRP (Properties)
(design and synthesis and properties of fluoronaphthalene deriv. liq. crystals for active matrix displays)
IT 247924-39-6 247924-91-0 **247924-93-2** 319906-29-1
319906-32-6 392729-01-0 392729-03-2
RL: FMU (Formation, unclassified); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(synthesis of fluoronaphthalene deriv. liq. crystals)
IT 2776-56-9, 6-Propyl-2-naphthol 15231-91-1, 6-Bromo-2-naphthol
79861-37-3
RL: RCT (Reactant); RACT (Reactant or reagent)
(synthesis of fluoronaphthalene deriv. liq. crystals)
RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Anon; GB 8900870
(2) Anon; JP 90166392
(3) Anon; JP 9752859 A
(4) Anon; DE OS4240041 1994
(5) Banks, R; J Chem Soc, Perkin Trans 1 1996, P2069 CAPLUS
(6) Differding, E; Synlett 1991, P187 CAPLUS
(7) Umemoto, T; J Org Chem 1998, V63, P3379 CAPLUS
(8) Wu, S; Chem Mater 1999, V11, P852 CAPLUS
(9) Wu, S; Mol Cryst Liq Cryst 1995, V264, P39 CAPLUS
IT **247924-94-3**
RL: PRP (Properties)
(design and synthesis and properties of fluoronaphthalene deriv. liq. crystals for active matrix displays)
RN 247924-94-3 CAPLUS
CN Naphthalene, 1,2,3-trifluoro-6-(trans-4-propylcyclohexyl)-, mixt. with 4-[(trans,trans)-4'-(3-butenyl)[1,1'-bicyclohexyl]-4-yl]-1,2-difluorobenzene and 4-[(trans,trans)-4'-ethenyl[1,1'-bicyclohexyl]-4-yl]-1,2-difluorobenzene (9CI) (CA INDEX NAME)

CM 1

CRN 247924-93-2
CMF C19 H21 F3

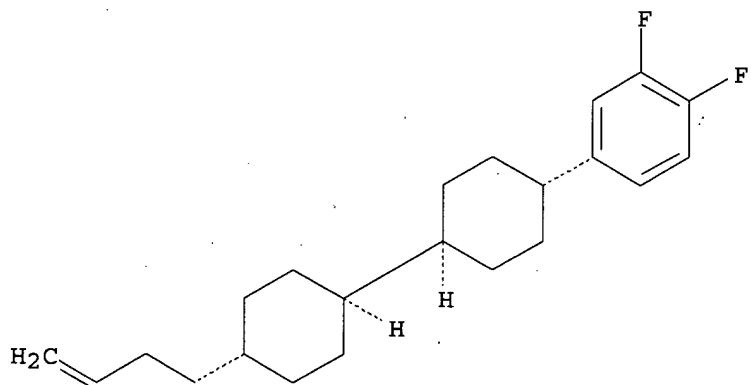
Relative stereochemistry.



CM 2

CRN 155266-68-5
CMF C22 H30 F2

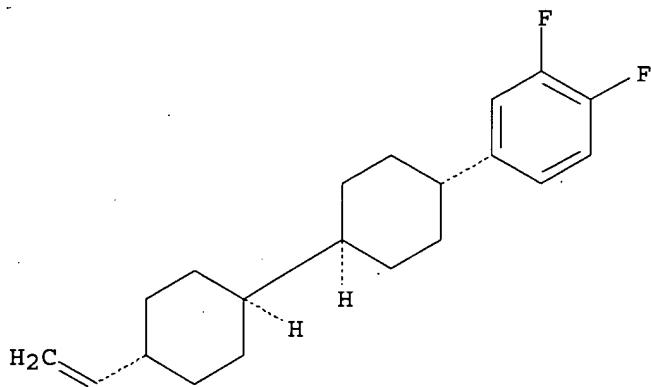
Relative stereochemistry.



CM 3

CRN 142400-92-8
CMF C20 H26 F2

Relative stereochemistry.



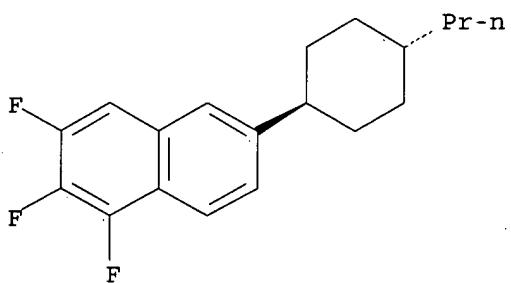
IT 247924-93-2

RL: FMU (Formation, unclassified); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(synthesis of fluoronaphthalene deriv. liq. crystals)

RN 247924-93-2 CAPLUS

CN Naphthalene, 1,2,3-trifluoro-6-(trans-4-propylcyclohexyl)- (9CI) (CA INDEX NAME)

Relative stereochemistry.



L7 ANSWER 5 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2001:482004 CAPLUS

DN 135:84408

TI Nematic liquid crystal mixture for liquid crystal display

IN Ogawa, Shinji; Onishi, Hiroyuki; Kato, Naoe; Takeuchi, Kiyofumi; Takatsu, Haruyoshi

PA Dainippon Ink and Chemicals, Inc., Japan

SO Jpn. Kokai Tokkyo Koho, 14 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C09K019-42

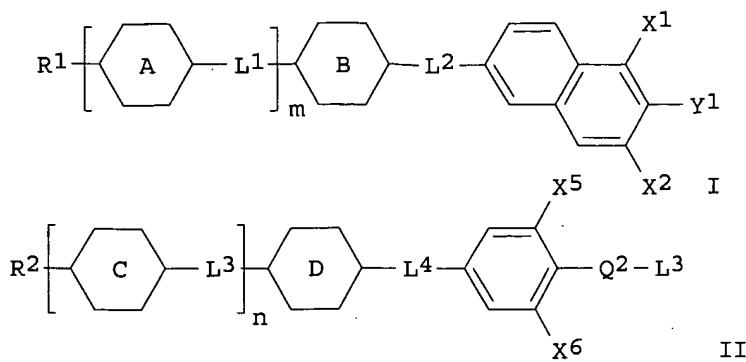
ICS C09K019-10; C09K019-30; C09K019-32; C09K019-34; G02F001-13

CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 75

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001181638	A2	20010703	JP 1999-369603	19991227
PRAI	JP 1999-369603		19991227		
OS	MARPAT 135:84408				
GI					



AB The title liq. crystal mixt., showing pos.-dielec. anisotropy, includes a liq. crystal(s) selected from I (R1 = C1-15-alkyl, C2-15-alkenyl; A, B = trans-1,4-cyclohexyl, 1,4-phenylene, 1,4-cyclohexenylene, 1,4-bicyclo(2.2.2)octylene, piperidine-1,4-diyl, naphthalene-2,6-diyl, decahydronaphthalene-2,6-diyl, 1,2,3,4-tetrahydronaphthalene-2,6-diyl; L1, L2 = -COO-, -OCO-, -CH2O-, -OCH2-, -CH2CH2-, -CH:CH-, -C.tplbond.C-, -(CH2)4-, -CH:CHCH2CH2-, -CH2CH2CH:CH-, single bond; X1, X2 = F; Y1 = F, Cl, CF2, OCF3, OCHF2, OCH2F, CN, C1-15-alkyl, C2-15-alkenyl; m = 0-2) and a liq. crystal(s) selected from II (R2 = C1-15-alkyl, C2-15-alkenyl; C, D = trans-1,4-cyclohexyl, 1,4-phenylene, 1,4-cyclohexenylene, 1,4-bicyclo(2.2.2)octylene, piperidine-1,4-diyl, naphthalene-2,6-diyl, decahydronaphthalene-2,6-diyl, 1,2,3,4-tetrahydronaphthalene-2,6-diyl; L3, L4 = -COO-, -OCO-, -CH2O-, -OCH2-, -CH2CH2-, -CH:CH-, -C.tplbond.C-, -(CH2)4-, -CH:CHCH2CH2-, -CH2CH2CH:CH-, single bond; X5, X6 = H, F; n = 0-2; Y3 = F, Cl, CN; Q2 = single bond, -CF2-, -OCF2-, -OCHF-). The liq. crystal display shows excellent properties.

ST nematic liq crystal mixt liq crystal display

IT Liquid crystal displays

(nematic liq. crystal mixt. suitable for active matrix liq. crystal display)

IT Liquid crystals

(nematic; nematic liq. crystal mixt. suitable for active matrix liq. crystal display)

IT 158570-17-3

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(in nematic liq. crystal mixt. suitable for active matrix liq. crystal display)

IT 247924-93-2P

RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(in nematic liq. crystal mixt. suitable for active matrix liq. crystal display)

IT 82832-57-3 82832-58-4 118164-50-4 129738-34-7 131819-24-4

131819-25-5 132123-39-8 139215-67-1 139215-80-8 139420-31-8

155041-85-3 158521-22-3 173855-56-6 262604-14-8

RL: TEM (Technical or engineered material use); USES (Uses)

(in nematic liq. crystal mixt. suitable for active matrix liq. crystal display)

IT 38078-09-0, DAST (fluorinating agent) 79861-37-3 140681-55-6

RL: RCT (Reactant); RACT (Reactant or reagent)

(synthesis of liq. crystal for nematic liq. crystal mixt. suitable for active matrix liq. crystal display)

IT 247924-91-0P, 1,2-Difluoro-6-(trans-4-propylcyclohexyl)naphthalene

319906-29-1P 319906-32-6P, 1,1,2,2-Tetrafluoro-6-(trans-4-

propylcyclohexyl)-1,2-dihydronaphthalene 319906-33-7P,

1,1,2,2-Tetrafluoro-6-(trans-4-propylcyclohexyl)-1,2,3,4-tetrahydronaphthalene

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(synthesis of liq. crystal for nematic liq. crystal mixt. suitable for active matrix liq. crystal display)

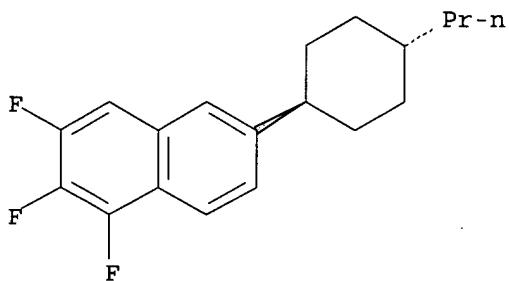
IT 247924-93-2P

RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(in nematic liq. crystal mixt. suitable for active matrix liq. crystal display)

RN 247924-93-2 CAPLUS

CN Naphthalene, 1,2,3-trifluoro-6-(trans-4-propylcyclohexyl)- (9CI) (CA INDEX NAME)

Relative stereochemistry.



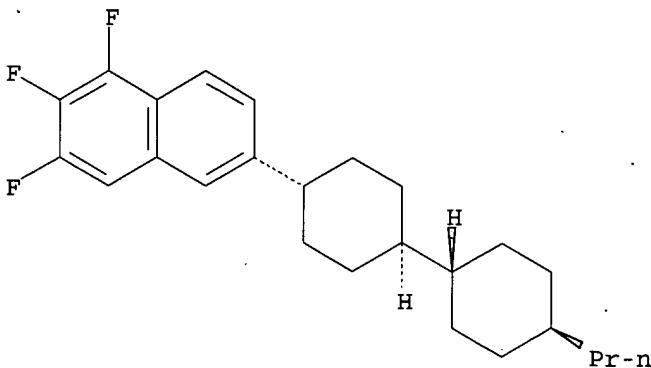
IT 262604-14-8

RL: TEM (Technical or engineered material use); USES (Uses)
(in nematic liq. crystal mixt. suitable for active matrix liq. crystal display)

RN 262604-14-8 CAPLUS

CN Naphthalene, 1,2,3-trifluoro-6-[(trans,trans)-4'-propyl[1,1'-bicyclohexyl]-4-yl]- (9CI) (CA INDEX NAME)

Relative stereochemistry.



L7 ANSWER 6 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2001:444648 CAPLUS

DN 135:53854

TI Liquid crystal compositions showing wide nematic temperature range and low viscosity and displays therewith

IN Onishi, Hiroyuki; Ogawa, Shinji; Kato, Naoe; Takatsu, Haruyoshi; Takeuchi, Kiyofumi; Kusumoto, Akio

PA Dainippon Ink and Chemicals, Inc., Japan

SO Jpn. Kokai Tokkyo Koho, 14 pp.

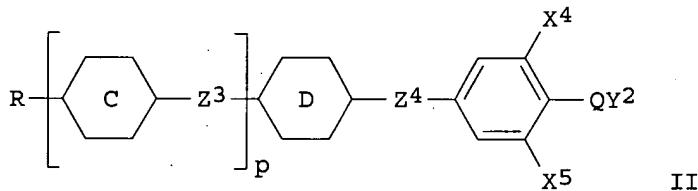
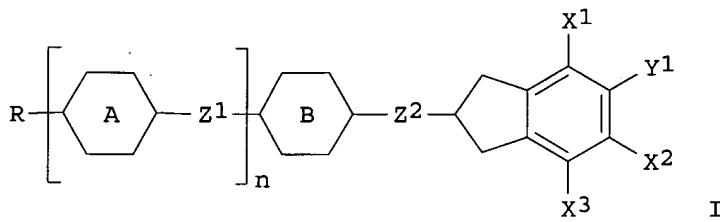
CODEN: JKXXAF

DT Patent

LA Japanese
 IC ICM C09K019-42
 ICS C09K019-32; C09K019-44; C09K019-46; G02F001-13
 CC 75-11 (Crystallography and Liquid Crystals)
 Section cross-reference(s): 74

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001164252	A2	20010619	JP 1999-354285	19991214
PRAI	JP 1999-354285		19991214		
OS	MARPAT 135:53854				
GI					



AB The compns., for (super)twisted nematic or active-matrix LCD exhibiting low threshold voltage and rapid response, possess pos.-dielec.-anisotropic indane derivs. I and II [R = C1-15 alkyl, C2-15 alkenyl; ring A-D = trans-1,4-cyclohexylene, 1,4-C6H4, 1,4-cyclohexenylene, 1,4-bicyclo(2.2.2)octylene, piperidine-1,4-diyl, (decahydro)naphthalene-2,6-diyl, and 1,2,3,4-tetrahydronaphthalene-2,6-diyl (only for A and B); n = 0, 1; p = 0, 1, 2; Z1-4 = CO2, OCO, etc.; X1-3, Y1= H, F, CF3, etc.; X4, X5 = H, F; Y2 = F, Cl, CN; Q = single bond, CF2, OCF2, OCHF].

ST nematic liq crystal display indane deriv; viscosity low nematic liq crystal indane; dielec anisotropy pos indane liq crystal

IT Liquid crystals

(nematic; nematic liq. crystal compns. with wide liq.-cryst. temp. range and low viscosity and displays therewith)

IT	7465-91-0	22692-80-4	24785-38-4	54211-46-0	56131-48-7	61203-99-4
	61204-01-1	67589-39-3	67589-52-0	80221-11-0	80944-44-1	
	81701-13-5	82832-27-7	82832-57-3	83242-83-5	84655-98-1	
	84656-75-7	85312-59-0	86504-59-8	86776-50-3	86776-51-4	
	86776-52-5	86776-54-7	86786-89-2	88038-92-0	89129-90-8	
	92118-81-5	92118-82-6	92118-83-7	94737-82-3	95495-15-1	
	95495-17-3	96624-52-1	97398-80-6	98321-58-5	100980-86-7	
	102714-95-4	102714-96-5	107215-73-6	107392-37-0	107949-21-3	
	109970-66-3	111158-10-2	116020-44-1	116090-24-5	116090-25-6	
	116090-30-3	116090-36-9	116090-37-0	116903-46-9	117923-35-0	
	118164-51-5	119990-81-7	120893-64-3	123843-69-6	129738-34-7	
	129738-42-7	131819-23-3	131819-25-5	131997-93-8	132123-39-8	
	134412-17-2	134412-18-3	137019-95-5	137644-54-3	142400-92-8	
	146781-29-5	146781-31-9	153429-48-2	155041-85-3	155266-68-5	
	156243-60-6	156243-63-9	157453-50-4	157453-51-5	157453-54-8	

157453-55-9	160239-89-4	161712-59-0	161712-61-4	163671-93-0
163671-97-4	167949-24-8	167949-26-0	167949-36-2	167949-39-5
169152-17-4	171623-53-3	173855-56-6	173855-57-7	175859-28-6
177572-62-2	183137-74-8	183436-88-6	183436-91-1	188298-14-8
189387-72-2	189387-74-4	193089-62-2	193090-11-8	193090-14-1
201613-43-6	202652-64-0	203176-88-9	203176-90-3	205806-88-8
216435-59-5	221246-76-0	229960-08-1	247924-38-5	247924-41-0
247924-60-3	247924-91-0	247924-93-2	247924-99-8	
262604-35-3	262604-51-3	262604-58-0	262604-83-1	324534-11-4
324754-79-2	337366-98-0	344940-53-0	344940-54-1	344940-55-2
344940-56-3	344940-57-4	344940-58-5	344940-59-6	344940-60-9
344940-61-0				

RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (nematic liq. crystal compns. with wide liq.-cryst. temp. range and low
 viscosity and displays therewith)

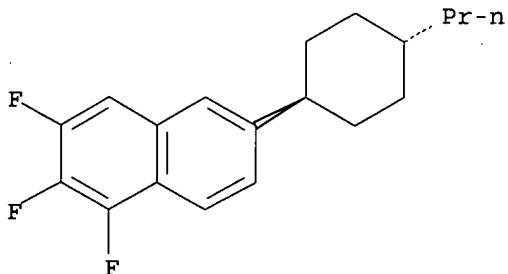
IT **247924-93-2**

RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (nematic liq. crystal compns. with wide liq.-cryst. temp. range and low
 viscosity and displays therewith)

RN 247924-93-2 CAPLUS

CN Naphthalene, 1,2,3-trifluoro-6-(trans-4-propylcyclohexyl)- (9CI) (CA
 INDEX NAME)

Relative stereochemistry.



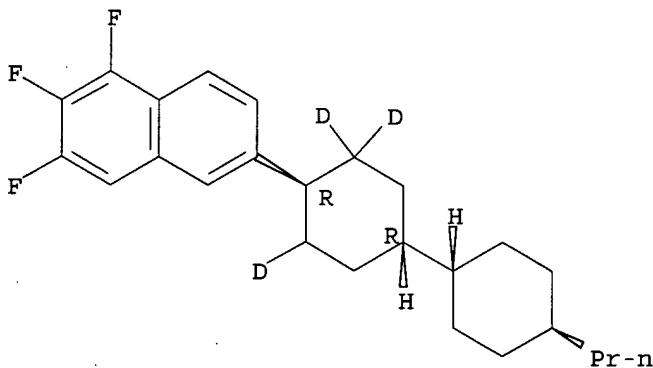
L7 ANSWER 7 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
 AN 2001:117299 CAPLUS
 DN 134:170930
 TI Nematic liquid crystal composition for liquid crystal display device
 IN Takeuchi, Kiyofumi; Onishi, Hiroyuki; Takatsu, Haruyoshi; Kaneoya,
 Masakazu
 PA Dainippon Ink and Chemicals, Inc., Japan
 SO Jpn. Kokai Tokkyo Koho, 38 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM G09F009-35
 ICS C09K019-06; C09K019-32; C09K019-34; C09K019-42; G02F001-13;
 G09F009-30
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other
 Reprographic Processes)
 Section cross-reference(s): 75
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	-----	-----	-----	-----
PI JP 2001042793	A2	20010216	JP 1999-212421	19990727
PRAI JP 1999-212421		19990727		
OS MARPAT 134:170930				
AB The nematic liq. crystal compn. contains .gtoreq.2 kinds of liq. crystals having a ring structure, wherein the liq. crystal contains .gtoreq.1 deuterated hydrogens. The compn. contains 0.1-100 % of the liq. crystal.				

The compn. provides the display device having the improved voltage retention.

ST nematic liq crystal compn display device deuterated hydrogen
IT Liquid crystal displays
(nematic liq. crystal compn. for liq. crystal display device)
IT Liquid crystals
(nematic; nematic liq. crystal compn. for liq. crystal display device)
IT 59855-03-7 59855-05-9 86504-59-8 86776-50-3 86776-52-5
87334-50-7 92263-41-7 124500-46-5 129738-42-7 133622-74-9
155041-85-3 158521-22-3 163671-93-0 167949-36-2 173855-56-6
177572-62-2 183436-88-6 188298-14-8 189387-72-2 189387-74-4
193089-62-2 193090-11-8 216435-59-5 **262604-36-4**
262604-54-6 262604-62-6 325814-52-6 325814-53-7 325814-54-8
325814-55-9 325814-56-0 325814-57-1 325814-58-2 325814-60-6
325814-61-7 325814-62-8 325814-63-9 325814-64-0 325814-66-2
325814-67-3 325814-68-4 325814-69-5 325814-70-8 325814-71-9
325814-72-0 325814-73-1 325814-75-3 325814-82-2 325814-83-3
325814-84-4 325814-85-5 325819-94-1
RL: DEV (Device component use); USES (Uses)
(nematic liq. crystal compn. for liq. crystal display device)
IT **262604-36-4**
RL: DEV (Device component use); USES (Uses)
(nematic liq. crystal compn. for liq. crystal display device)
RN 262604-36-4 CAPLUS
CN Naphthalene, 1,2,3-trifluoro-6-[(1R,1'.alpha.,4R,4'.beta.)-4'-propyl[1,1'-bicyclohexyl]-4-yl-3,3,5-d3]- (9CI) (CA INDEX NAME)

Relative stereochemistry.



L7 ANSWER 8 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2001:107960 CAPLUS
DN 134:186024
TI Nematic liquid crystal compositions containing naphthalene derivatives and liquid crystal displays thereof
IN Takeuchi, Kiyofumi; Takatsu, Haruyoshi
PA Dainippon Ink and Chemicals, Inc., Japan
SO Jpn. Kokai Tokkyo Koho, 108 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C09K019-32
ICS C09K019-34; C09K019-42; G02F001-13; G09F009-30; G09F009-35
CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001040354	A2	20010213	JP 1999-213363	19990728

PRAI JP 1999-213363
OS MARPAT 134:186024
GI

19990728

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

AB The nematic liq. crystal compns. contain (A) .gtoreq.1 naphthalene derivs. I-III (.gtoreq.1 CH group in naphthalen-2,6-diyl ring may be substituted with N; R1, R2 = alkyl, alkenyl, etc.; W1-W6 = H, F, Cl, CF3, OCF3, CN; K1, K2 = single bond, CH2CH2, etc.; ring A1, A2 = 1,4-phenylene, trans-1,4-cyclohexylene, naphthalen-2,6-diyl, etc.), (B) 0-99.9% liq. cryst. components other than I-III and having dielec. anisotropy .gtoreq.+2, and (C) 0-98% liq. cryst. components having dielec. anisotropy -10 to +2 (B + C = 0-99.9%). The compns. have improved compatibility and low temp. storage stability. The nematic liq. crystal compns. are employed in active matrix, twisted nematic, super twisted nematic, or light scattering-type liq. crystal displays.

ST naphthalene deriv nematic liq crystal display

IT Liquid crystal displays
(nematic liq. crystal compns. contg. naphthalene derivs. and liq. crystal displays thereof)

IT Liquid crystals
(nematic; nematic liq. crystal compns. contg. naphthalene derivs. and liq. crystal displays thereof)

IT 176519-24-7P, Kayarad HX 220-lauryl acrylate copolymer
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(light-controlling layer; nematic liq. crystal compns. contg. naphthalene derivs. and liq. crystal displays thereof)

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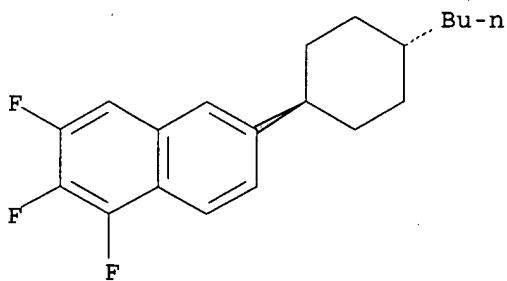
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mixts. contg. 325961-63-5D, mixts. contg.

RL: DEV (Device component use); USES (Uses)
(nematic liq. crystal compns. contg. naphthalene derivs. and liq.
crystal displays thereof)

IT 262604-41-1D, mixts. contg.
RL: DEV (Device component use); USES (Uses)
(nematic liq. crystal compns. contg. naphthalene derivs. and liq.
crystal displays thereof)

RN 262604-41-1 CAPLUS
CN Naphthalene, 6-(trans-4-butylcyclohexyl)-1,2,3-trifluoro- (9CI) (CA INDEX
NAME)

Relative stereochemistry.



L7 ANSWER 9 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2001:41952 CAPLUS

DN 134:108116

TI Nematic liquid crystal composition for liquid crystal display device

IN Takeuchi, Kiyofumi; Kaneoya, Masakazu; Takatsu, Haruyoshi

PA Dainippon Ink and Chemicals, Inc., Japan

SO Jpn. Kokai Tokkyo Koho, 140 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C09K019-32

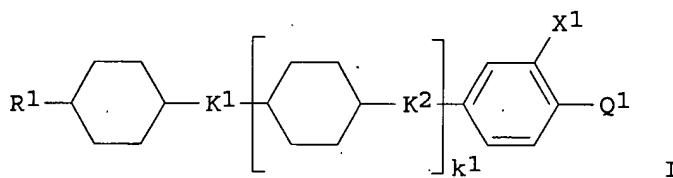
ICS C09K019-42; G02F001-13

CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

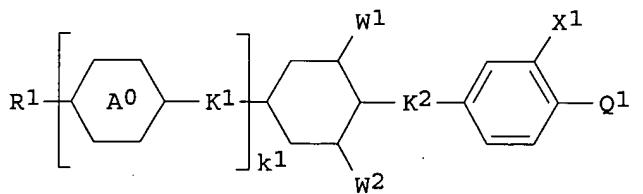
Section cross-reference(s): 75

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001011454	A2	20010116	JP 1999-187085	19990630
PRAI	JP 1999-187085				
OS	MARPAT 134:108116				
GI					



I



II

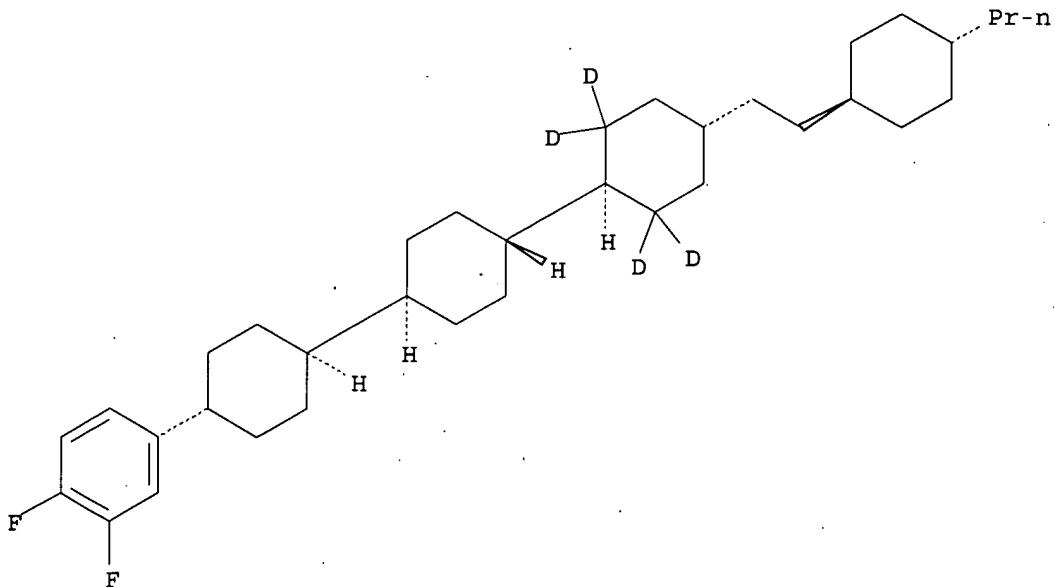
AB The title compn. consist of compds. chosen from I-II (R1 = C1-10 alkyl, C2-10 alkenyl; Q1 = F, Cl, CF3, OCF3, etc.; X1 = H, F, Cl, CF3, etc.; W1-2 = H, F, Cl, CF3, OCF3, CN; K1-2 = -COO-, -OCO-, -CH2O-, -OCH2-, etc.; A0 = trans-1,4-cyclohexylene, 1,4-phenylene, 2-fluoro-1,4-phenylene, etc.), specific compds. contg. a fused rings, 0-99.9 % of a liq. crystal component (B) of >toreq.2 dielec. anisotropic const., 0-85 % of liq. crystal component (C) of -10-+2 dielec. anisotropic const. The total content of component B and component C is 0-99.9 %. The compn. provides the wide operation temp., the lowered driving voltage, and the rapid response.

ST nematic liq crystal compn display
 IT Liquid crystal displays
 (nematic liq. crystal compn. for liq. crystal display)
 IT Liquid crystals
 (nematic; nematic liq. crystal compn. for liq. crystal display)
 IT 86504-59-8 92118-81-5 92118-82-6 129738-34-7 129738-42-7
 142400-92-8 153429-48-2 155041-85-3 155266-68-5 163671-93-0
 167949-39-5 167949-43-1 247924-91-0 262604-12-6 262604-58-0
 262605-20-9 262852-76-6 262852-78-8 318490-41-4 318490-42-5
 318490-43-6 318490-44-7 **318490-48-1** 318490-49-2
 318490-50-5 318490-52-7 318490-56-1 318490-57-2 318490-58-3
 318490-59-4 318490-60-7 318490-61-8
 RL: DEV (Device component use); USES (Uses)
 (nematic liq. crystal compn. for liq. crystal display)
 IT **318490-48-1**
 RL: DEV (Device component use); USES (Uses)
 (nematic liq. crystal compn. for liq. crystal display)
 RN 318490-48-1 CAPLUS
 CN Naphthalene, 1,2,3-trifluoro-6-(trans-4-propylcyclohexyl)-, mixt. with
 4-[(trans,trans)-4'-(3-butenyl)[1,1'-bicyclohexyl]-4-yl]-1,2-
 difluorobenzene, 1,2-difluoro-4-[(trans,trans,trans)-4''-[2-(trans-4-
 propylcyclohexyl)ethyl][1,1':4',1'''-tercyclohexane]-4-yl-2'',2'',6'',6'''-
 d4]benzene, 4-[(trans,trans)-4'-ethenyl[1,1'-bicyclohexyl]-4-yl]-1,2-
 difluorobenzene, (trans,trans)-4-ethenyl-4'-pentyl-1,1'-bicyclohexyl,
 4-[(trans,trans,trans)-4''-[2-(trans-4-ethylcyclohexyl)ethyl][1,1':4',1'''-
 tercyclohexane]-4-yl-2'',2'',6'',6'''-d4]-1,2-difluorobenzene,
 1-fluoro-6-(trans-4-propylcyclohexyl)-2-(3,4,5-trifluorophenyl)naphthalene
 and 1-fluoro-3-propyl-7-(3,4,5-trifluorophenyl)naphthalene (9CI) (CA
 INDEX NAME)

CM 1

CRN 318490-47-0
CMF C35 H50 D4

Relative stereochemistry.

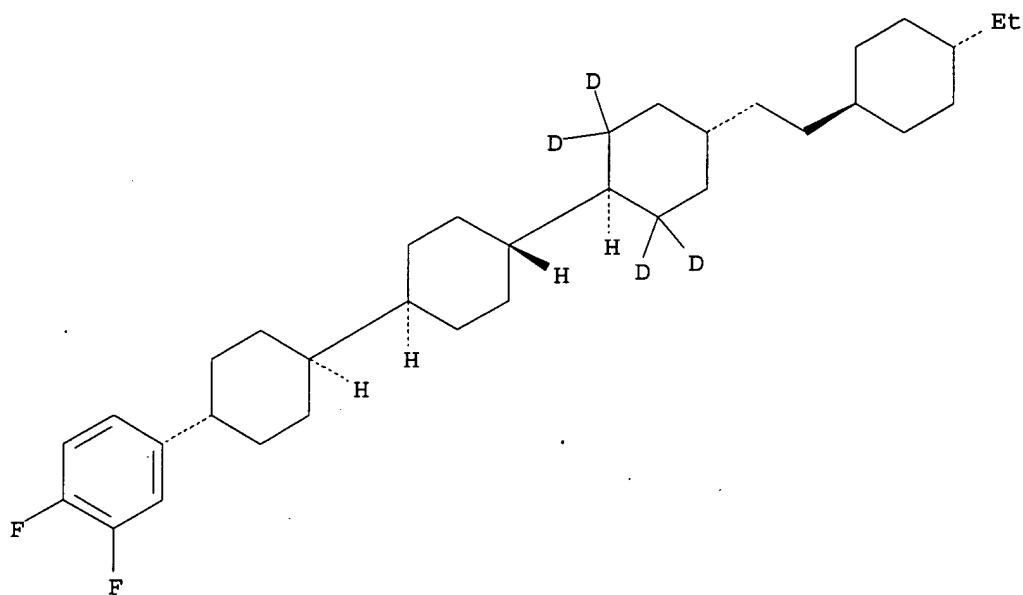


CM 2

CRN 318490-46-9

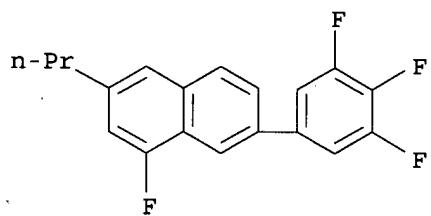
CMF C34 H48 D4 F2

Relative stereochemistry.



CM 3

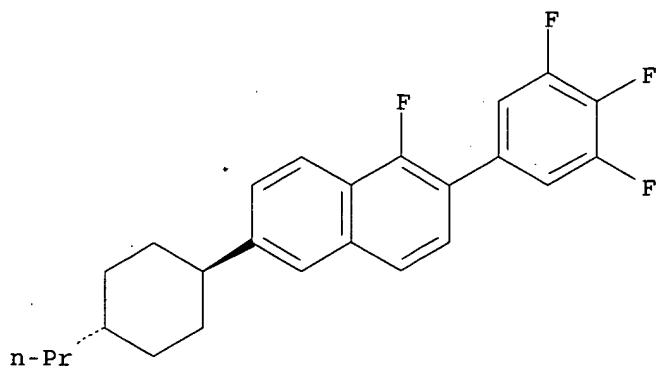
CRN 318490-45-8
CMF C19 H14 F4



CM 4

CRN 262604-58-0
CMF C25 H24 F4

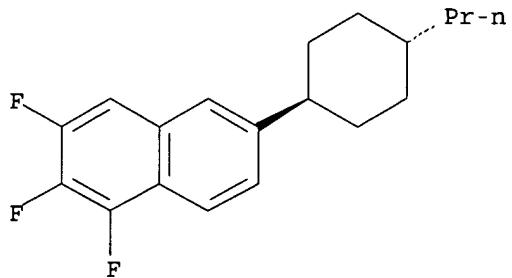
Relative stereochemistry.



CM 5

CRN 247924-93-2
CMF C19 H21 F3

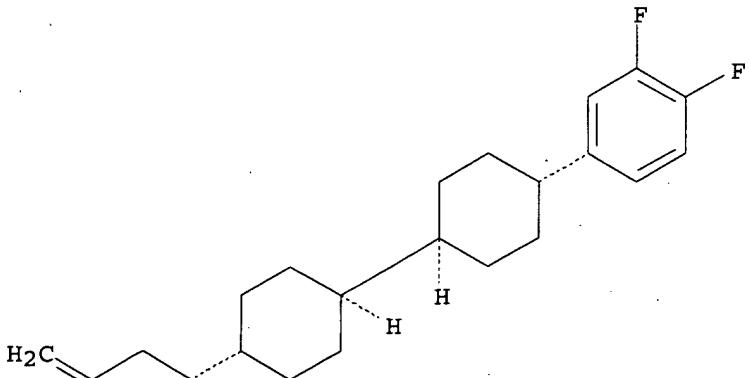
Relative stereochemistry.



CM 6

CRN 155266-68-5
CMF C22 H30 F2

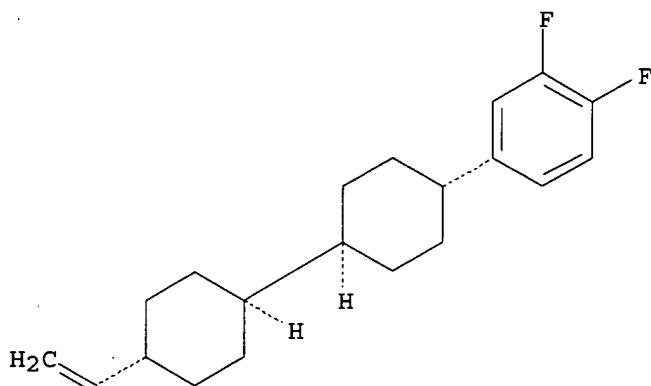
Relative stereochemistry.



CM 7

CRN 142400-92-8
CMF C20 H26 F2

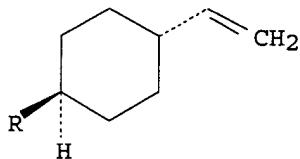
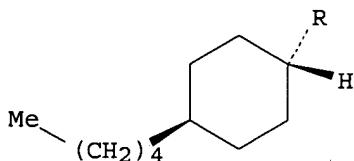
Relative stereochemistry.



CM 8

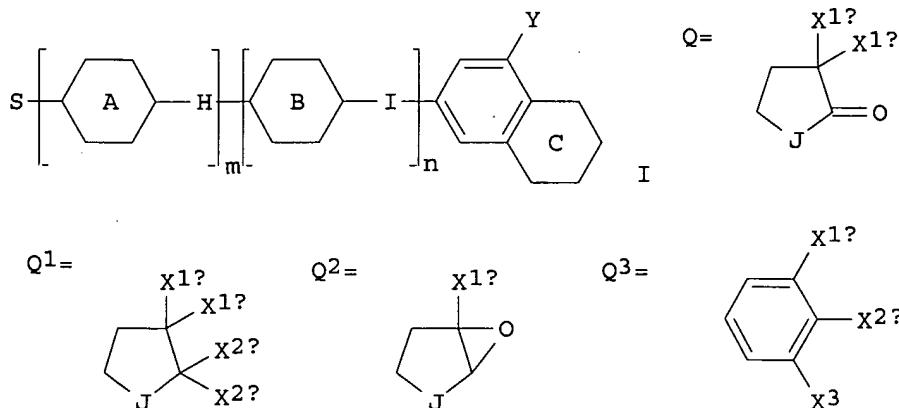
CRN 129738-34-7
CMF C19 H34

Relative stereochemistry.



L7 ANSWER 10 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2001:38469 CAPLUS
DN 134:108361
TI Preparation of 6-fluoronaphthalene derivatives as intermediates for liquid crystal and method for their preparation
IN Ogawa, Shinji; Ohnishi, Hiroyuki; Takehara, Sadao; Takatsu, Haruyoshi
PA Dainippon Ink and Chemicals, Inc., Japan
SO Jpn. Kokai Tokkyo Koho, 27 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C07C025-22
ICS C07C017-23; C07C017-25; C07C023-18; C07C049-697; C07D303-08;
G02F001-13; C07D301-26; C09K019-32
CC 75-11 (Crystallography and Liquid Crystals)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001010995	A2	20010116	JP 1999-184785	19990630
PRAI	JP 1999-184785		19990630		



AB The title compds. [I; S = C1-16 alkyl, C1-16 alkoxy, C2-16 alkenyl, C3-16 alkenyloxy, C1-10 alkoxy-C1-12 alkyl, HO, leaving group such as F, Cl, Br, iodo, CF₃SO₂O, MeSO₂O, PhSO₂O, or p-toluenesulfonyloxy; ring A and B = optionally F-substituted 1,4-phenylene, trans-1,4-cyclohexylene, trans-1,3-dioxane-2,5-diyl, pyridine-2,5-diyl, pyrimidine-2,5-diyl, pyrazine-2,5-diyl, pyridazine-2,5-diyl, 1,4-cyclohexylene, 1,4-bicyclo[2.2.2]octylene, piperidine-1,4-diyl, naphthalene-2,6-diyl, or decahydronaphthalene-2,6-diyl, 1,2,3,4-tetrahydronaphthalene-2,6-diyl; H, I = CH₂CH₂, C.tpbond.C, OCH₂, CH₂O, OCF₂, CF₂O, single bond; m, n = 0-2 and m+n.1toreq.3; Y = hydrogen, F, Cl; ring C = Q, Q₁, Q₂, Q₃; wherein J = CH:CH, CH₂CH₂; X_{1a}, X_{2a} = F, Cl, Br; X_{1b}, X_{2b} = hydrogen, F, Cl, Br, OH; X₃ = hydrogen, Cl, Br; provided that X_{1a} = X_{2a} .noteq. F in Q₃] are prep'd. Thus, 6-(trans-4-propylcyclohexyl)naphthalen-2-ol was fluorinated by adding portionwise 1-chloromethyl-4-fluoro-1,4-diazoniumbicyclo[2.2.2]octane bis(trifluoroborate) (F-TEDA-BF₄) in MeCN at room temp. for 5 h to give 1,1-difluoro-6-(trans-4-propylcyclohexyl)-1H-naphthalen-2-one, which was further fluorinated by diethylaminosulfur trifluoride (DAST) in THF at 50.degree. for 2 h to give 1,1,2,2-tetrafluoro-6-(trans-4-propylcyclohexyl)-1,2-dihydronaphthalene. The latter compd. was hydrogenated over 5% Pd-C and silica gel in Et₃N/EtOAc at hydrogen pressure 0.39 MPa for 3 h to give 1,1,2,2-tetrafluoro-6-(trans-4-propylcyclohexyl)-1,2,3-tetrahydronaphthalene which was dissolved in THF and stirred with potassium tert-butoxide at room temp. for 2 h to give 1,2-difluoro-6-(trans-4-propylcyclohexyl)naphthalene. This process uses readily available starting material and gives at low cost I which are expensive to be prep'd. by known methods.

ST fluorination naphthalenol; fluoronaphthalene prep'n intermediate liq crystal

IT Fluorination

Liquid crystals

(prep'n. of fluoronaphthalene derivs. as intermediates for liq. crystal via fluorination of naphthol deriv.)

IT 79861-37-3, 6-(trans-4-Propylcyclohexyl)naphthalen-2-ol

RL: RCT (Reactant); RACT (Reactant or reagent)

(prep'n. of fluoronaphthalene derivs. as intermediates for liq. crystal via fluorination of naphthol deriv.)

IT 247924-91-0P, 1,2-Difluoro-6-(trans-4-propylcyclohexyl)naphthalene

319906-29-1P, 1,1-Difluoro-6-(trans-4-propylcyclohexyl)-1H-naphthalen-2-

one 319906-32-6P, 1,1,2,2-Tetrafluoro-6-(trans-4-propylcyclohexyl)-1,2-

dihydronaphthalene 319906-33-7P, 1,1,2,2-Tetrafluoro-6-(trans-4-

propylcyclohexyl)-1,2,3,4-tetrahydronaphthalene 319906-34-8P,

1,1-Difluoro-6-(trans-4-propylcyclohexyl)-1,2-dihydronaphthalen-2-ol
 319906-35-9P 319906-36-0P
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (prepn. of fluoronaphthalene derivs. as intermediates for liq. crystal
 via fluorination of naphthol deriv.)

IT 247924-93-2P, 1,2,3-Trifluoro-6-(trans-4-
 propylcyclohexyl)naphthalene
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (prepn. of fluoronaphthalene derivs. as intermediates for liq. crystal
 via fluorination of naphthol deriv.)

IT 247924-93-2P, 1,2,3-Trifluoro-6-(trans-4-
 propylcyclohexyl)naphthalene
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (prepn. of fluoronaphthalene derivs. as intermediates for liq. crystal
 via fluorination of naphthol deriv.)

RN 247924-93-2 CAPLUS
 CN Naphthalene, 1,2,3-trifluoro-6-(trans-4-propylcyclohexyl)- (9CI) (CA
 INDEX NAME)

Relative stereochemistry.

